AS4000
Wireless Local Loop System

Demand Assignment
Access Concentrator
Installation and Commissioning

605-0000-453

Issue 1.2dr Date 7/02/00

This Page Intentionally Blank

Notice

1. This manual is subject to revision.

2.

3. Right of modification reserved.

4. This manual is supplied without liability for errors or omissions.

5.

6. This equipment is conditioned by the requirement that no modifications will be made to the equipment unless the changes or modifications are expressly approved by ACC Communications.

7. Prerequisite skills: Personnel installing, commissioning, and maintaining the Airspan products must have a basic knowledge of telephony and radio communications, and have experience in installing, commissioning and maintaining telecommunications products. ACC provides a range of comprehensive training courses specifically aimed at providing operators/users of AS4000 products with the prerequisite skills to install, commission and or maintain the product. The courses can be tailored to provide the level of training required by the operator/user.

8. Airspan™ and Sitespan™ are Registered Trademarks of Airspan Communications Corporation.

For additional information on Airspan Systems, please call your ACC Representative, or contact ACC at:

Cambridge House
Oxford Road
Uxbridge
Middlesex
UB8 1UN

Call (44) 1784 886700

This Page Intentionally Blank

Safety Instructions - Warnings and Cautions

SAFETY

1. Read and follow all warning notices and instructions marked on the product or included in this manual

2. Do not allow anything to rest on any power cord and do not locate the product where persons could step or walk on a power cord.

3. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.

4. No hazardous RF radiation is emitted from the equipment. Measured at the surface of the CRU radome, when transmitting, the maximum total power radiated from the CRU is 0.a1% of the UK National Radiological Protection Board basic restriction per kg. of body part.

WARNING - HAZARDOUS VOLTAGES

On AC installations, hazardous voltages exist. Use caution when verifying or working with AC power. Remove metal jewellery that could come into contact with AC power.

On DC sections, short circuiting the low voltage, low impedance circuits can cause severe arcing that may result in burns or eye damage. Remove rings, watches etc. to avoid shorting DC circuits.

Electro-Static Discharge ESD

Electro-Static Discharge. Many circuits contain devices that are susceptible to damage from high impedance voltage sources. To avoid such risks always follow anti-static procedures where marked.

NOTE

AS4000 products do not contain hazardous substances (as defined in UK 'Control of Substances Hazardous to Health Regulations 1989', and the 'Dangerous Substances Regulations 1990'). At the end of any Airspan product's life cycle, the customer should consult with Airspan to ensure that the product is disposed of in conformance with the relevant regulatory requirements

CE

The CE Symbol on an Airspan product signifies that it has been certified according to the EMC directive 89/336/EEC. The product fulfils the requirements according to the following standards:

EN50082-1 Immunity.
EN55022 Group 1 Class A for the Central Terminal Emissions.
EN55022 Group 1 Class B for the Subscriber Terminal Emissions.

NOTE

The Subscriber Terminal equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

User Response Form

Mail: Airspan Communications Limited
Cambridge House
Oxford Road
Uxbridge
Middlesex
UB8 1UN

Fax: (44) 01895-467182

Document Rating	Excellent	Good	Average	Below Average	Poor
Accuracy / Completeness	❑	❑	❑	❑	❑
Clarity / Organisation	❑	❑	❑	❑	❑
Figures	❑	❑	❑	❑	❑
Table of Contents/Index	❑	❑	❑	❑	❑

The nature of this response is Addition ❑ Deletion ❑ Correction ❑

Please enter details of response below (include precise reference to Section, Page, Paragraph)

Please complete the following for acknowledgement/response:

Name:	.....	Address	.....
Company	.....		.....
Job Title	.....		.....
Department	.....		.....
Telephone	.....		.....

Thank you for your co-operation and assistance.

This Page Intentionally Blank

ISSUE CONTROL LIST

Title	Issue	Date	Issue Details
Title Page	1.2	August 2000	
ICL-001	1.2	August 2000	
IXL-001	1.2	August 2000	
GSI-001	1.2	August 2000	
GSI-002	1.2	August 2000	
GSI-003	1.2	August 2000	
DLP-001	1.2	August 2000	
DLP-002	1.2	August 2000	
DLP-003	1.2	August 2000	
DLP-004	1.2	August 2000	
DLP-005	1.2	August 2000	
DLP-006	1.2	August 2000	
DLP-007	1.2	August 2000	
DLP-008	1.2	August 2000	
DLP-009	1.2	August 2000	
DLP-010	1.2	August 2000	
DLP-011	1.2	August 2000	
Appendix 1	1.2	April 2000	
Appendix 2	1.2	April 2000	
Appendix 3	1.2	April 2000	
Appendix 4	1.2	April 2000	

CHANGE TYPE/DATE	PURPOSE	PAGES AFFECTED
Draft Issue #, Month Year		

INDEX TASK LIST

List of Figures

List of Tables

Abbreviations

AC	Alternating Current
AGC	Automatic Gain Control
AU	Analogue Unit
A/D	Analogue/Digital
CPE	Customer Premises Equipment
CRU	Customer Radio Unit
CT	Central Terminal
CTU	Concentrated Tributary Unit (Access Terminal Shelves)
CU	Compression Unit
DA	Demand Assignment
DC	Direct Current
DMM	Digital Multi Meter
DRS	Digital Radio System
DTU	Demand Assignment Tributary Unit
FA	Fixed Assignment
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunications Union -Telecommunications
LD	Loop Disconnect
LED	Light Emitting Diode
MF	Multi-Frequency
MSTP	Modem Shelf Termination Panel
MU	Modem Unit
NTU	Network Termination Unit
PC	Power Control
PSU	Power Supply Unit
RF	Radio Frequency
SC	Shelf Controller
SPU	Signalling Processing Unit
ST	Subscriber Terminal
Rx	Receive
Tx	Transmit
TU8	Tributary Unit Eight E1 ports
VDU	Video Display Unit
VF	Voice Frequency
XTU	Exchange Tributary Unit (E1 protocol: CAS, V5.1, V5.2)

Related Documentation

605-0000-450	System Overview
605-0000-451	System Operations and Maintenance Manual
605-0000-452	Central Terminal - Installation & Commissioning
605-0000-433	Central Terminal - Antenna/Feeder Installation & Commissioning
605-0000-454	Subscriber Terminal - Installation & Commissioning
605-0000-437	D128 Terminal Converter
605-0000-435	Material Return and Repair
605-0000-427	Sitespan

This Page Intentionally Blank

INTRODUCTION

1. Purpose of Document

This document describes the installation and commissioning of the ACC AS4000 Access Concentrator (AC) Rack and associated shelves to Release 5.0 specifications.

2. Prerequisite skills

Personnel installing and commissioning the AS4000 products must have a basic knowledge of telephony and radio communications, and have experience in installing telecommunications products. ACC provides a range of comprehensive training courses specifically aimed at providing operators/users of AS4000 products with the prerequisite skills to install, commission and or maintain the product. The courses can be tailored to provide the level of training required by the operator/user.

This manual is intended for use by persons familiar with the AS4000 product having attended the ACC Access Concentrator Installation and Commissioning training course prior to performing the procedures in this practice.

This Page Intentionally Blank

OVERVIEW

1. Installation Tasks

The installation procedures are arranged as a series of tasks and are generalised to cover the majority of applications and configurations. If your particular system application is not covered, call the ACC Help Desk, for assistance at the following number: TELEPHONE: +44 (0) 1527 402800

It is recommended that the tasks be completed in the sequence listed below:

- Task 1 — Verify Site facilities
- Task 2 — Unpack and Inspect Equipment
- Task 3 — AC Rack Installation
- Task 4 — System Interface Cabling
- Task 5 — Module/Card insertion
- Task 6 — System Test
- Task 7 — Test Results
- Task 8 — Connection to management system.
- Task 9 — Work Area Inspection and Cleaning
- Task 10 — Acceptance Procedure

2. Safety

 Personnel installing the ACC AS4000 System should follow ACC safety procedures W090 0001 001 Issue 01 April 96

2.1. Hazardous Voltages

 There are hazardous voltages present in the shelves of this equipment. Do not touch components or track on the cards while they are in operation.

On AC installations, hazardous voltages exist. Use caution when verifying or working with AC power. Remove metal jewellery that could come into contact with AC power.

On DC sections, short circuiting the low-voltage, low-impedance circuits can cause severe arcing that may result in burns or eye damage. Remove rings, watches, etc. to avoid shorting DC circuits. Do not install power modules in the shelf until the shelf and rack are properly mounted and secured.

2.2. ESD

Electro-Static Discharge. Many circuits contain devices that are susceptible to damage from high impedance voltage sources. To avoid such risks always follow anti-static procedures.

TECHNICAL SPECIFICATIONS

1. Access Concentrator

The following tables provide technical specifications for the AS4000 Access Concentrator.

Physical Characteristics	
AC Rack Dimensions, (without brackets):	
Width	600mm
Height	2175mm
Depth	300mm
Shipping Weight**:**	
Rack Frame	60 kg
AC Shelf	
Card Set	

Table 1. Physical Characteristics.

Environmental		
	Minimum	Maximum
Operating Temperature	-5° C	+45° C
Relative Humidity, non-condensing	0%	95%
Storage Temperature	-40° C	85° C
Storage Humidity, non-condensing	Less than 100%	
Air Pressure	70 kPa	106 kPa

Table 2. Environmental Specifications.

POWER REQUIREMENTS	
DC Input Voltage Operating Range. (N.B. This supply to be a guaranteed SELV from an EN60950 approved source.)	Maximum Range, -21.8V DC to -60.aV DC @ 540W
DC Input Current (Fully populated AC Rack)	25 Amps max. @ -21V DC 11.5 Amps max. @ -48V DC 9 Amps max. @ -60V DC
Recommended Power Distribution Fusing (With a readily accessible disconnect device which will isolate all poles.)	-21. 8V DC to -60V DC 30Amps High Inrush
Power Distribution CT Fusing	-21.8V DC to -60V DC 30Amps each feed

Table 3. Power Requirements.

Warning. The maximum DC input should not exceed 60 Volts. Voltages in excess of this are considered hazardous.

PREPARATORY TASKS

1. Installation Tools and Equipment

The following lists of tools and equipment are required to successfully install and test the AS4000 Access Concentrator Racks.

1.1. Required Tools

- Combination Spanners: 8 mm, 13 mm, 17 mm, & 19 mm.
- Spirit Level: 18 inch.
- Pozidrive: No 1 x 75 mm.
- No 2 x 100 mm
- No 3 x 150 mm.
- Screwdriver, flat blade: 3 mm x 100 mm.
- Screwdriver, flat blade: 5.5 mm x 100 mm.
- Screwdriver, flat blade: 8 mm x 150 mm.
- Hammer, Ball Pein: 1lb.
- Drill Bits, Masonry: 11 mm, 12 mm, 13 mm.
- Ratchet Crimp Tool for red, blue and yellow insulated crimps.
- Crimp Tool type 6A with VQ dies for co-ax connectors.
- Cordless Drill/Driver.

1.2. Required Equipment

Item	Description	Recommended Model	Quantity
1	Digital Multimeter	Fluke 77 or similar	1
2			
3			
4			
5			
6			
7			

Table 4. Required Test Equipment.

2. Site Readiness

Verify that the site is ready for the installation of the AC Rack.

This preparation will have been covered by a site survey conducted by ACC or by a survey form completed by the customer. The survey will include a site plan of the facility identifying the floor layout, power outlets, distribution boxes, and cabling runways. A sketch showing the rack support arrangements showing the exact positions of the mounting points on the rack with dimensions, and typical overhead ironwork provision should be included.

Inspect the site, and particularly the equipment room, before unloading or unpacking the equipment to ensure the following:

- Adequate grounding is provided.
- Access to the equipment room will be adequate for normal handling and movement.
- Adequate lighting is available for carrying out the installation.

Any non compliance with acceptable standards should be bought to the customers attention and resolved before proceeding with the installation.

2.1. Power Availability

From the site survey, confirm the location of the two fuse positions for the negative battery supply and the return point. Also locate the fuse position for the alarm unit 55B power supply.

2.2. Site Earth

Confirm the position of the grounding point using the site survey.

2.3. Flooring

Ensure that flooring is substantial enough to support the rack and can provide a secure fixing.

2.4. Cable Trays

Verify that cable trays are installed to provide routing to the proper destinations and are of adequate strength

2.5. Delivery Inspection

Upon taking delivery of the equipment consignment, check that the consignment agrees in all particulars with the consignment delivery documentation (number of boxes, descriptions, and the contents of boxes, etc.). Any discrepancy or damage must be reported immediately to ACC for further instructions. In case of severe damage, do not accept the consignment from the carrier. See Material Return and Repair document 605-0000-427 for further details. The equipment is normally shipped as shown in. Figure 1.

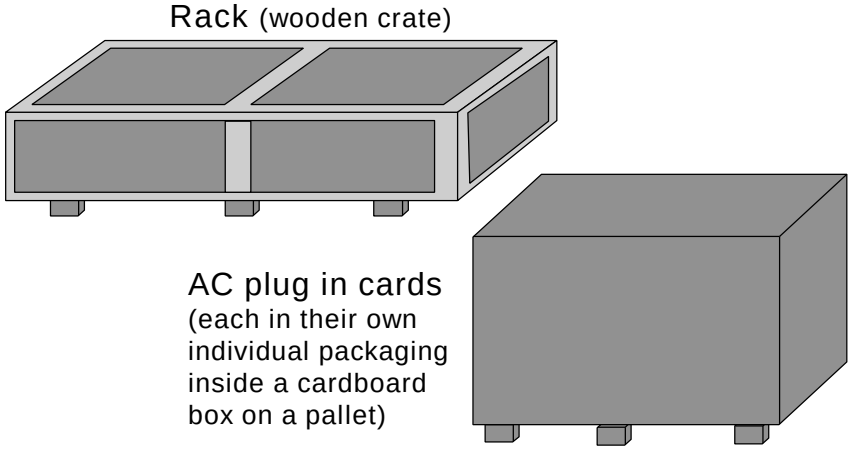


Figure 1. Packaging for AC Site

If subsequent to the initial shipment incremental upgrades are made to the system the equipment will be delivered in packaging of size and type suitable for that shipment.

2.6. Unpacking Inspection

The contents of each box must be checked against the relevant part lists provided with the box, for the correct part numbers and quantities, and for damage. Any shortage or damaged items must be reported immediately to ACC for further instructions at the address given in section 0 of this manual or:

TELEPHONE: +44 (0) 1527 402800

FAX: +44 (0) 1527 550956

E-Mail: support@airspan.com

Dispose of all unnecessary packaging in a safe manner according to the customer's requirements.

Note: It is recommended that one package carton of each type be retained should it be required to return any faulty or damaged items for repair.

RACK INSTALLATION

1. Positioning and Securing Racks

1.1. Installing Rack in a Suite

From the site survey, confirm the position of the AC Racks. If the racks are to be positioned in a suite, metalwork will be required to secure it to the overhead structure. Either a proprietary system or fabricated steelwork will be required - see site survey.

Manoeuvre the racks into position.

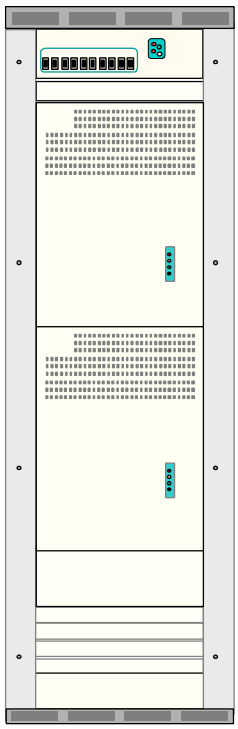


Figure 2. Access Concentrator Rack.

1.2. Securing Rack Base

Using the base of the rack as a template, mark the floor locating positions through the cut-outs in the Rack Frame. Using a 13mm diameter drill bit, drill four holes to a depth of approximately 25mm. Position the rack over the four holes and screw the four (supplied) M12 screws through washers to secure the rack base.

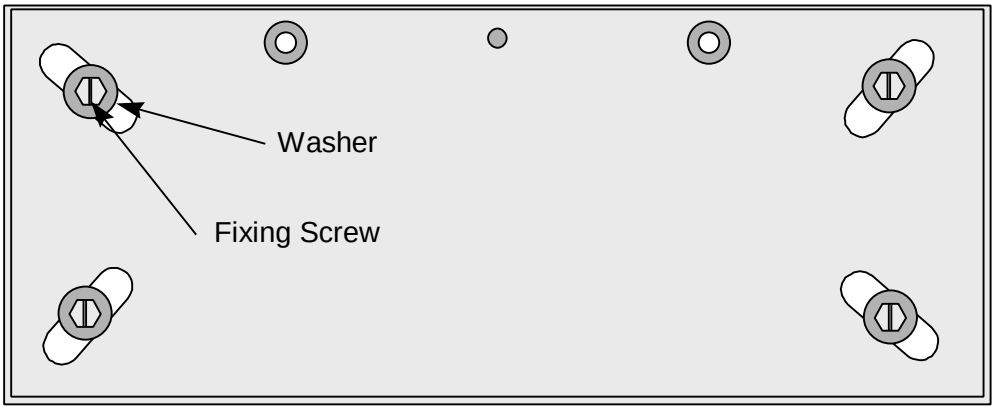


Figure 3. Securing Rack Base

Warning: These screws are provided as locating pins only and must be used in conjunction with the overhead steelwork and not as an alternative method for securing the rack.

Temporarily secure the rack to adjacent racks or steelwork until the overhead support is in place.

1.3. Securing the rack using overhead Ironwork

Assemble the overhead steelwork as required and secure the rack to the overhead structure using suitable fixings in compliance with local requirements. Remove all burrs and sharp edges.

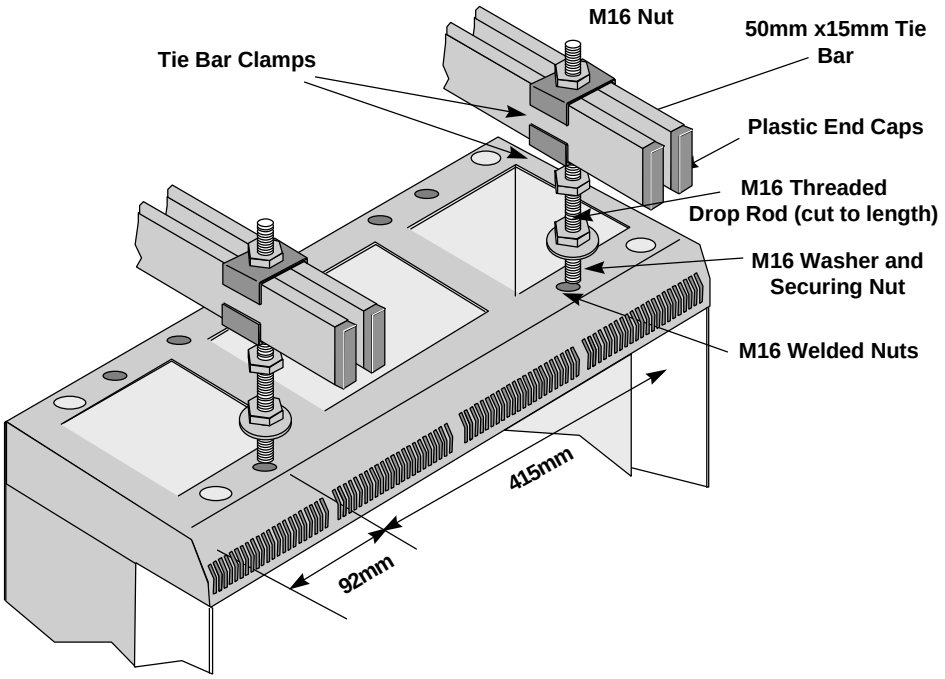


Figure 4. Typical Overhead Ironwork Support

Note: In installations where threaded droprods in excess of 500mm are employed it may be necessary to provide additional support bars to ensure rigidity of the support structure.

1.4. Securing a Rack to a Wall

If the rack is to be positioned against a wall, attach the two right-angled wall brackets (these brackets are part on the packaging) to the top of the rack and finger tighten with the provided M12 screws.

Manoeuvre the racks into position against the wall. Join the racks together with 12mm nuts and bolts placed through the holes at the top and bottom of the side panels and mark the wall through the holes in the top brackets.

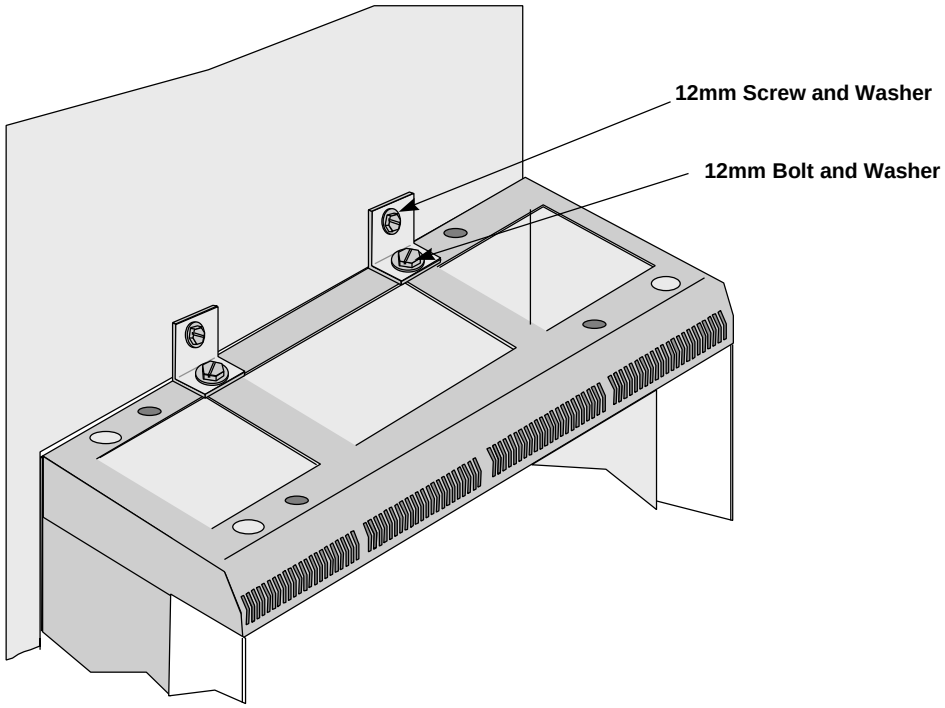


Figure 5. Securing Rack To Wall

Using an 11mm. drill bit, drill holes in the wall to a depth of 75mm and fit masonry plugs. Fix the hex head screws through the brackets and finger tighten. Check that the rack is in the correct position and tighten all fixings.

Attention should be paid to the fabric of the wall. Where possible, drill directly into the brick and not into mortar. With panelled or partitioned walls, instruction should be taken locally as to how the rack is to be secured. See site survey.

Follow the procedure for the rack base as described in paragraph 1.2.

ACCESS CONCENTRATOR RACK CABLING

1. DC Power

The cables for the negative DC battery feeds, the 0V returns and the Rack Ground are detailed in Table 2. Should local requirements specify otherwise, it is acceptable for cables of other colours to be used, however, under no circumstances should the cable sizes be less than that specified in Table 2. The length of the cable supplied will be detailed in the site survey. Separate DC sources are desirable for maximum protection.

Function	Colour	Min. Cable Size
Negative Battery Feed	Blue	10 AWG; 6.0mm^2
Zero Volt Battery Return	Black	10 AWG; 6.0mm^2
Rack Ground	Green/Yellow	8AWG; 10.amm^2

Table 5. DC Power Cables.

Warning.

The maximum DC input should not exceed 60 Volts. Voltages in excess of this are considered hazardous.

From the site survey confirm the location of the isolator for the negative battery feed points; then ensure that the supply is isolated. If the location is remote from the AC, take appropriate action to ensure that the supply is not inadvertently reconnected. This may include locking OFF an isolator, by taking its unique handle with you or ensuring that replacement fuses are not easily installed. Provide a label at the AC to indicate the location of the isolator or fuse positions mentioned above.

Run and tie in the two negative battery feeds and the two zero volt returns to the AC rack installed. These should be rated at 30A. Power cables must be run and tied separate from signal cables.

Note: Do not insert fuses until instructed to do so in the commissioning stage of installation.

Run the DC cables through the top right hand side of the rack, into the fuse and alarm panel.

Remove clear plastic cover protecting the DC input terminals. Trim cables and strip 7mm. Crimp a spade terminal or terminal ring onto the wire and attach to terminals inside the Fuse and Alarm panel at the appropriate connection points. The negative supplies go to Termination Block 1 & 4. The positive battery returns go to 2 & 5. See Figure 6. Replace clear plastic cover protecting the DC input terminals.

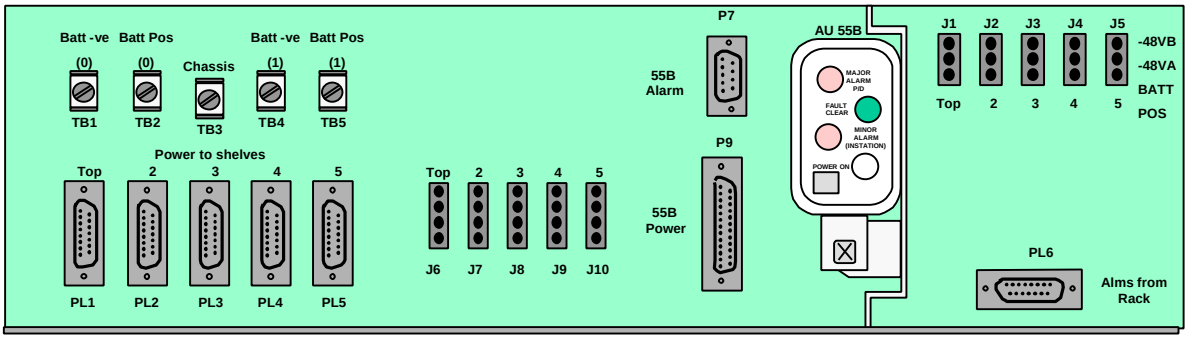


Figure 6. DC Termination on Combiner Shelf.

2. Rack Earthing

Using the site survey, locate the building central [safety] grounding point. Run an earth cable rated at 30A to <u>each</u> rack and connect it to the centre earth stud located at the top <u>or</u> bottom (not both) of the rack. See Figure 7. These points are labelled with the IEC Earth symbol. ⏚.

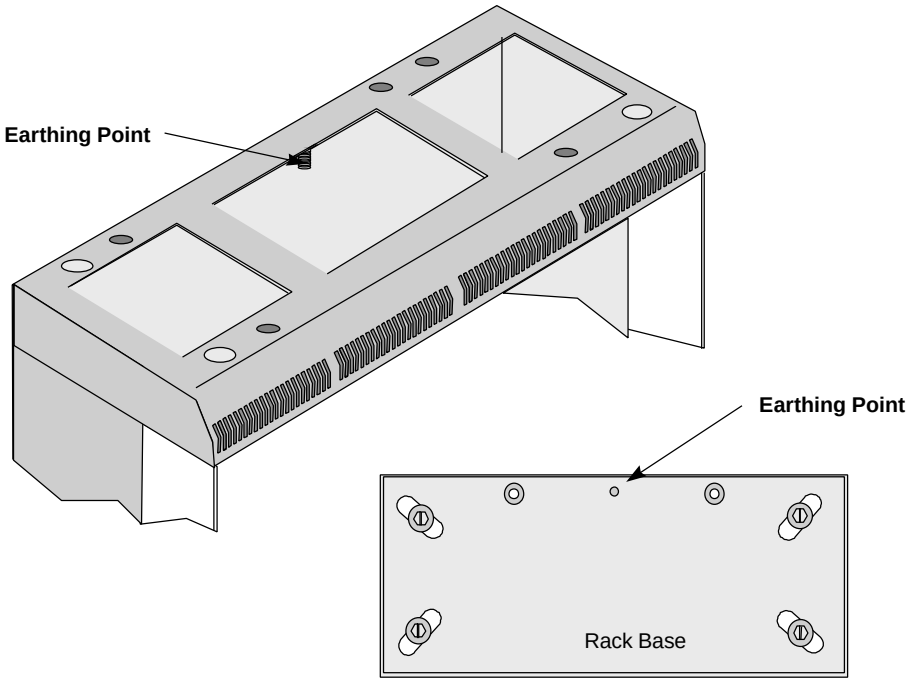


Figure 7. Rack Earthing

Warning: Other external safety earth connections must not be made to the rack. The two studs located towards the sides at the top of the rack are used for earth bonding the side and rear panels to the rack and must be left untouched to maintain the systems safety earthing integrity.

Terminate the battery feed and return cables at the isolator/fuse positions, and ensure that the AC rack is isolated until the commencement of commissioning tests.

3. Alarm Unit (Type 55B) External Connections

Run alarm cables from the station alarm scheme to the AU55B in the Fuse and Alarm Panel in the AC Rack. Terminate on the 25 way D-Type connector as shown in Figure 8 and to the station alarm scheme. Connect the -48V/24V alarm supply to the alarm supply fuse box using 1.0mm cable and terminate on the D-type connector.

If a visual indication at the rack is all that is required, connect the alarm unit from the D-type connector on the AU55B to P9 in the Fuse and Alarm Panel.

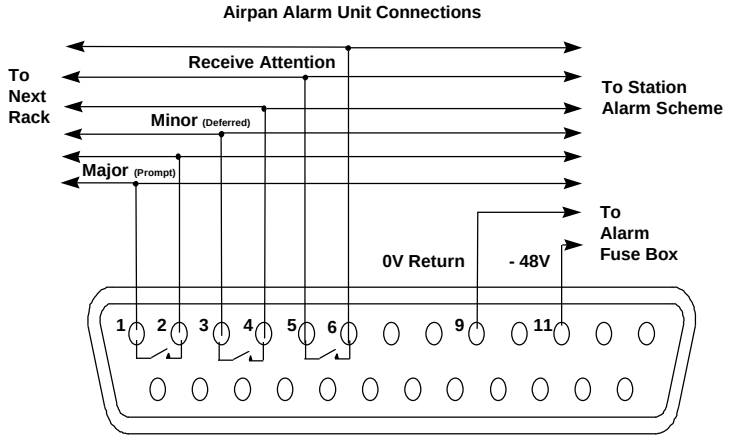


Figure 8. AS4000 Alarm Unit Connections

The 10 way alarm ribbon from the AU55B should be connected to P7 on the alarm panel.

4. Access Concentrator Interface Panel

All cabling to the access concentrator connects to the interface panel. Slots 4,5 and 6 can be used for 75Ω and 120Ω connections. Slots 7-14 are used for 120Ω connections Each slot will support up to 8 E1 connections.

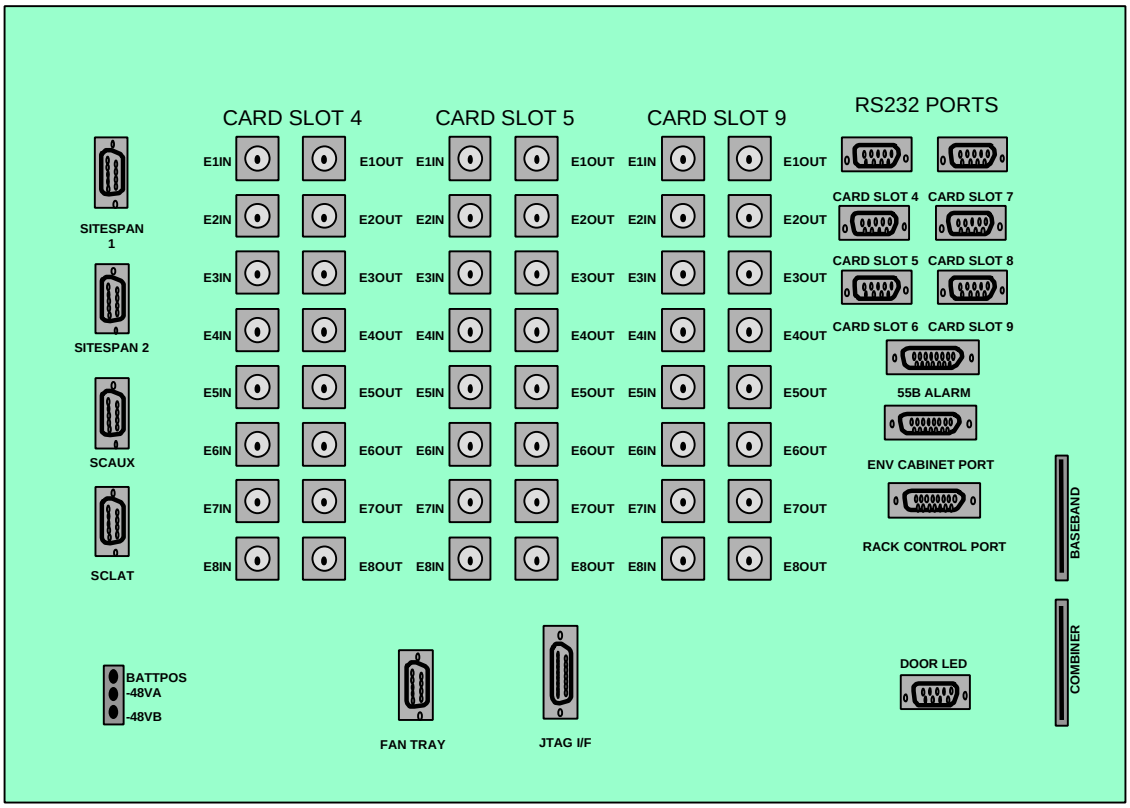


Figure 9. Access Concentrator Interface Panel (1010 Board)

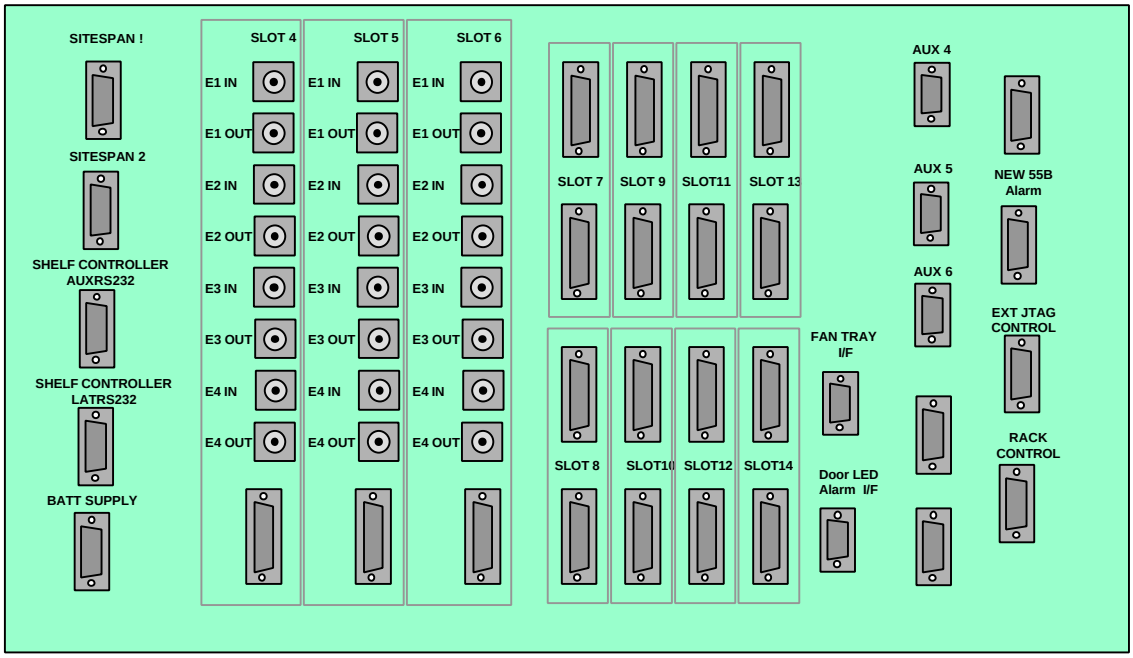


Figure 10. Access Concentrator Interface Panel (1026 Board)

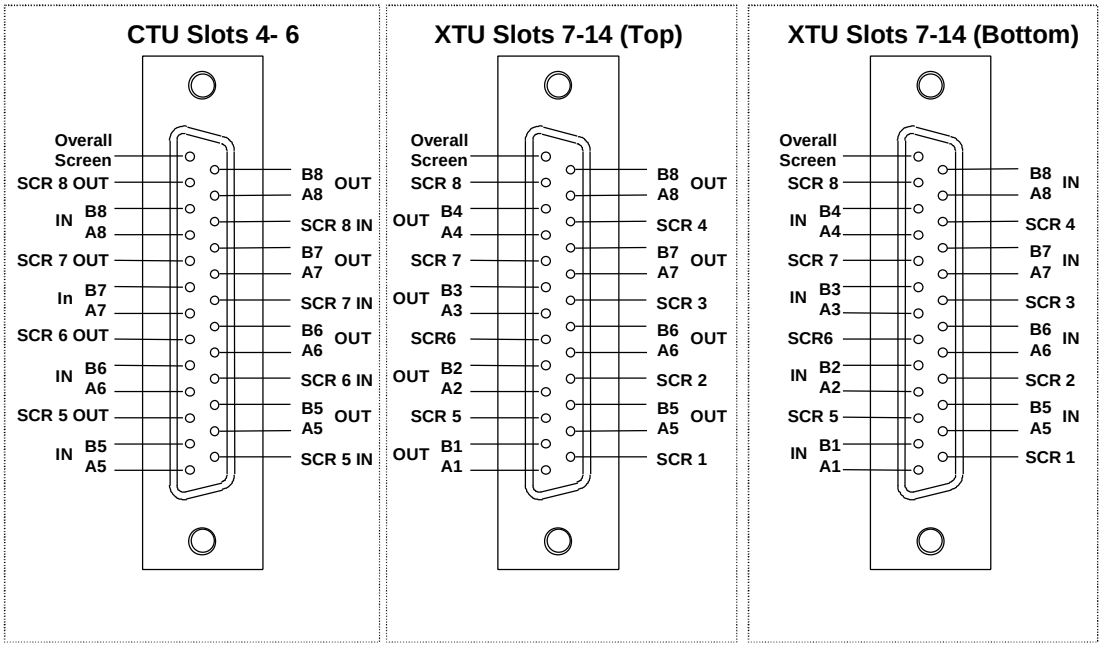


Figure 11. 120ohm connections to AC shelf

5. 120 Cabling Specification

The cable with the following characteristics to be used for interconnection between the AC shelf and switch/channel bank: Double screened, 120Ohm, 8 twisted pairs. The overall screen should be screened with a foil AND a 90% coverage tinned copper braid.

6. 2Mbit/s Cabling (CT Link)

From the site survey, confirm the location of the Digital Distribution Frame (DDF) if a DDF is to be used or the CT link if the 2Mbit/s feeds are fed direct to the equipment. The length of 2Mbit/s feeds should not exceed 250 metres.

Note: This must be a SELV port of an EN 60950 approved product.

Run the 2Mbit/s cables from the AC shelf to the allocated positions on the DDF. (Two cables per shelf in normal working, four cables per shelf in protected mode).
In partial equipped installations it may be appropriate to run enough cables to cater for a complete rack of equipment. This reduces the need to disturb original installation when adding additional equipment.

Feed the 2Mbit/s cables through the top hole on the most convenient side of the rack, and down the front of the rack.

Identify and label each cable at both ends as well as the DDF/Backhaul positions.

Terminate all cables with BNC co-axial connectors.

7. 2Mbit/s Cabling (Switch Link)

From the site survey, confirm the location of the Digital Distribution Frame (DDF) if a DDF is to be used or the Switch if the 2Mbit/s feeds are fed direct to the equipment. The length of 2Mbit/s feeds should not exceed 250 metres.

Note: This must be a SELV port of an EN 60950 approved product.

Run the 2Mbit/s cables from the AC shelf to the allocated positions on the DDF. In partial equipped installations it may be appropriate to run enough cables to cater for a complete rack of equipment. This reduces the need to disturb original installation when adding additional equipment.

Feed the 2Mbit/s cables through the top hole on the most convenient side of the rack, and down the front of the rack.

Identify and label each cable at both ends as well as the DDF/Backhaul positions.

Terminate all cables with either BNC co-axial connectors (75Ω) or 25 pin D-type connectors (120Ω) according to the tables below.

Pair	Designation		Pin	
1	A5	In	1	
	B5	In	2	
	Screen		14	
2	A6	In	4	
	B6	In	5	
	Screen		17	
3	A7	In	7	
	B7	In	8	
	Screen		20	
4	A8	In	10	
	B8	In	11	
	Screen		23	
5	A5	Out	15	
	B5	Out	16	
	Screen		3	
6	A6	Out	18	
	B6	Out	19	
	Screen		6	
7	A7	Out	21	
	B7	Out	22	
	Screen		9	
8	A8	Out	24	
	B8	Out	25	
	Screen		12	
Overall Screen			13	

Pair	Designation		Pin	
1	A1	In	1	
	B1	In	2	
	Screen		14	
2	A2	In	4	
	B2	In	5	
	Screen		17	
3	A3	In	7	
	B3	In	8	
	Screen		20	
4	A4	In	10	
	B4	In	11	
	Screen		23	
5	A5	In	15	
	B5	In	16	
	Screen		3	
6	A6	In	18	
	B6	In	19	
	Screen		6	
7	A7	In	21	
	B7	In	22	
	Screen		9	
8	A8	In	24	
	B8	In	25	
	Screen		12	
Overall Screen			13	

Pair	Designation		Pin	
1	A1	Out	1	
	B1	Out	2	
	Screen		14	
2	A2	Out	4	
	B2	Out	5	
	Screen		17	
3	A3	Out	7	
	B3	Out	8	
	Screen		20	
4	A4	Out	10	
	B4	Out	11	
	Screen		23	
5	A5	Out	15	
	B5	Out	16	
	Screen		3	
6	A6	Out	18	
	B6	Out	19	
	Screen		6	
7	A7	Out	21	
	B7	Out	22	
	Screen		9	
8	A8	Out	24	
	B8	Out	25	
	Screen		12	
Overall Screen			13	

This Page Intentionally Blank

CARD INSTALLATION

The AC rack is shipped with shelves fitted to customer requirements and internal cabling complete.

Warning: Before handling any cards or modules, observe full anti-static precautions

1. Preliminary

In a new installation Ensure that the AC Circuit on the Fuse and Alarm panel are switched are set to the OFF position (down) See Figure 12.

Warning: Isolation of power from the rack is only achieved by ensuring that both circuit breakers are in the off position.

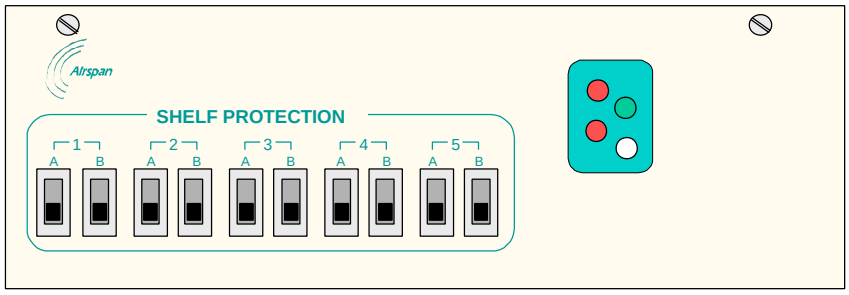


Figure 12. Access Concentrator Rack Fuse and Alarm Panel

Ensure that the end of suite fuses are adequately rated and insert these into the respective fuse holder positions.

2. Card Insertion

Insert the cards into the shelves, recording the serial numbers and revision status in the test form. See DLP007. The actual cards provided will depend upon the customer configuration.

a) The load Sharing PSUs go in slots 1&2.

b) The Shelf Controller goes in slot 3.

c) All other slot positions are configurable via Sitespan.

d) 3 CTUs are supported. Each CTU supports 4 CT modem shelves. Each CTU may be cabled for four 120Ω E1s or four 75Ω E1s.

e) 8 XTUs are supported. Each XTU may be cabled for eight 120Ω E1s.

f) CU cards may go in any unused slot. (slots 15& 16 are preferred as they have no E1 connections.

g) Slot 17 is available for card redundancy using a spare TU8 card, any other slot E1s may be routed to this slot by relay operation.

Figure 13 and Figure 14 below show typical card installation for V5.1 and V5.2 applications.

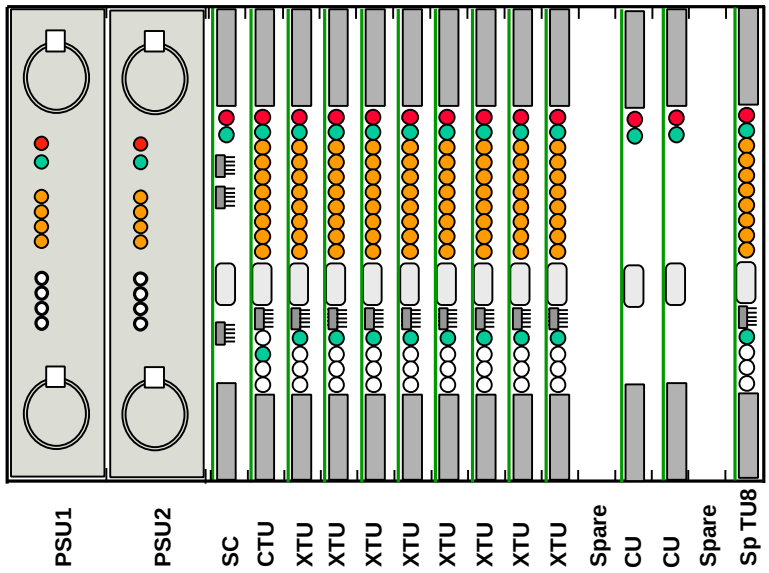


Figure 13. Typical Card set for V5.1

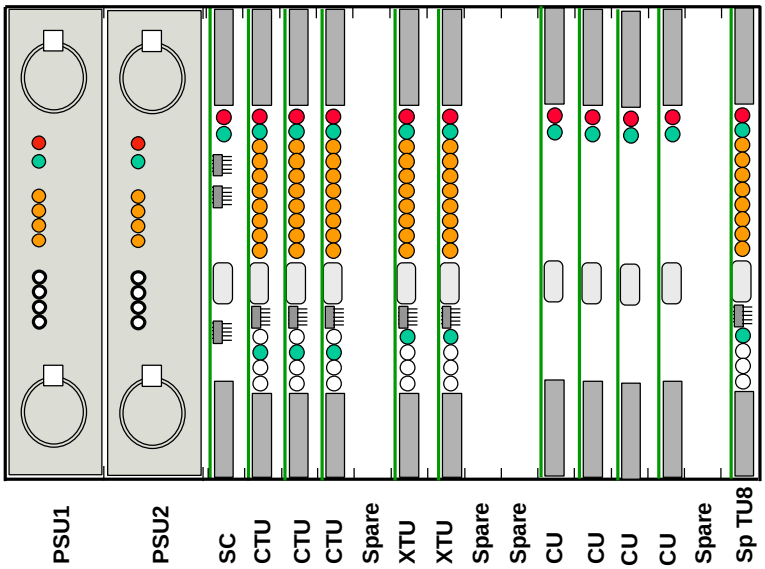


Figure 14. Typical card set for V5.2

This Page Intentionally Blank

SYSTEM TESTING

This section sets up the parameters for the system and the connection to Sitespan.

Refer to the Sitespan, document no. 605-0000-428 for the detailed configuration and set up procedures of the AS4000 System.

1. General

The following procedures need to be carried out in order to verify the functionality and operation of all cards fitted into the Access Concentrator prior to placing the AS4000 system into service.

If during testing, a fault occurs preventing the continuation of the test, the faulty module or card should be replaced and the test repeated for the card and all tests that are affected by the performance of that card.

All results must be entered on the Commissioning Test Result Sheet (DLP-014). Test forms should be photocopied as needed, ensure that sufficient copies of all sheets are available prior to the commencement of commissioning tests.

2. Card Provision for New Installation

Switch the Access Concentrator Rack **ON** by placing both breakers up and wait for the system to complete the power-up self test sequence successfully. The two breakers duplicate power to each shelf and the shelves will still function if one power supply fails though the LED indicators on the power supplies will not be on.

Using the DMM check that the DC voltage supply across the input terminals (TB1(-); TB2+;.for Supply 1 and TB4(-); TB5(+) for supply 2). Ensure that the voltage measured complies with the site nominal voltage and is within the limits specified on the test results sheet.

2.1. PSU Voltage AC Shelves: (Test 2a)

Using the DMM, measure and record the DC voltage at the front panel test points on each of the PSU's on the AC Shelf.

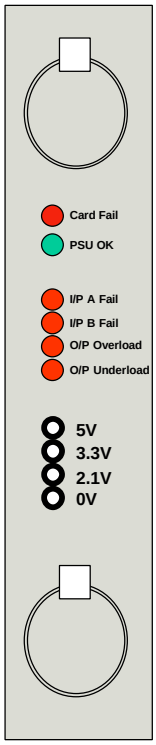


Figure 15. AC Shelf PSU

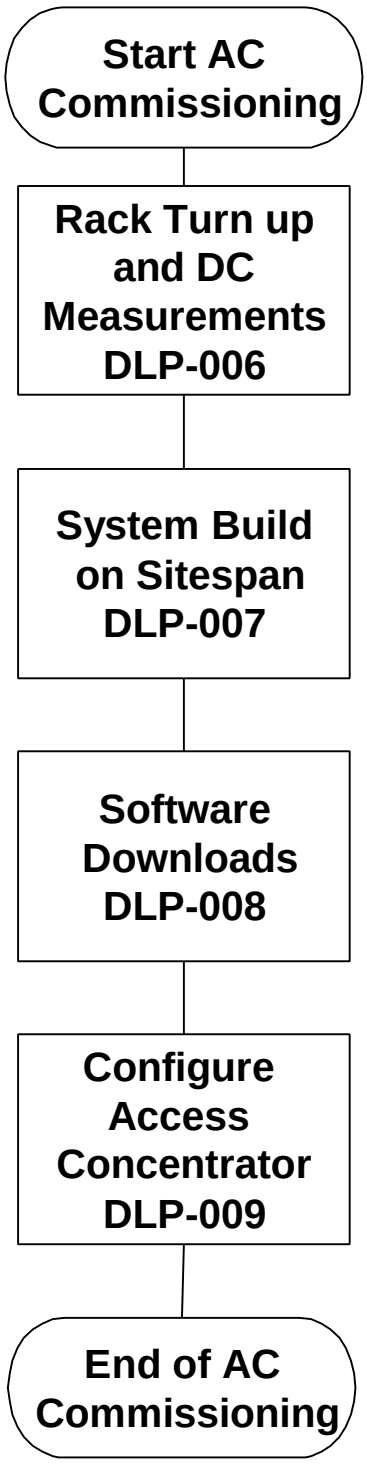
Ensure that the voltages measured are within the limit shown in Table 6. Record the results in test form.

Voltage	Upper Limit	Lower Limit
5V DC	5.25V	4.75V
3.3V DC	3.0V	3.3V
2.1V DC	2.1V	2V

Table 6. . PSU Voltage Test

3. Commissioning rack

The chart below shows the commissioning and testing process. The reference in brackets is the corresponding paragraph in the text. Tests are shown with a rounded corner box and procedures are shown in a square box. In addition each test has a number indicating the order of testing and reference for the test record sheets.


Start AC Commissioning
Rack Turn up and DC Measurements DLP-006
System Build on Sitespan DLP-007
Software Downloads DLP-008
Configure Access Concentrator DLP-009
End of AC Commissioning

This Page Intentionally Blank

TURN-UP AND DC MEASUREMENTS

STEP **PROCEDURE**

1. Rack Turn-Up and Measuring Input Voltage(Test 1a)

This section describes the procedure for measuring and connecting DC to the rack, checking that the cards have the correct alarm indications on power-up and measuring the PSU output voltages.

Unscrew retaining screws on the face of the Fuse and Alarm Panel. Hinge forward the panel and using the DMM measure and record the Exchange DC voltage supply across the input terminals (TB1(-); TB2+;.for Supply 1 and TB4(-); TB5(+) for supply 2). Ensure that the voltage measured complies with the site nominal voltage and is within the limits specified on the test results sheet.

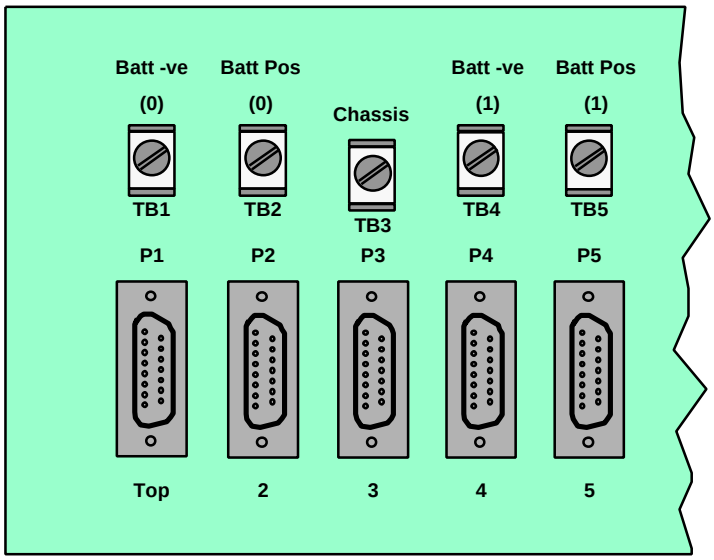


Figure 16. Test Voltage (Expansion Rack)

Record the measured voltage on the test results sheet.

2. Switching on the rack. (Test 1b)

Switch the AC Shelves **ON** by placing both breakers up for each shelf and wait for the system to complete the power-up self test sequence successfully. The two breakers duplicate power to each shelf and the shelves will still function if one power supply fails though the LED indicators on the power supplies will not be on.

Using the DMM check that the DC voltage supply across the input terminals (TB1(-); TB2+;.for Supply 1 and TB4(-); TB5(+) for supply 2). Ensure that the voltage measured complies with the site nominal voltage and is within the limits specified on the test results sheet.

3. PSU Voltage AC Shelves: (Test 2a)

Using the DMM, measure and record the DC voltage at the front panel test points on each of the PSUs on the Access Concentrator Shelf.

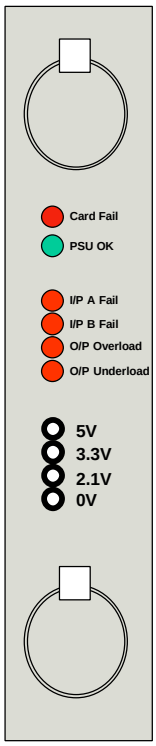


Figure 17. Access Concentrator Shelf PSU

Ensure that the voltages measured are within the limit shown in Table 7. Record the results in test form.

Voltage	Upper Limit	Lower Limit
5V DC	5.25V	4.75V
3.3V DC	3.0V	3.3V
2.1V DC	2.1V	2V

Table 7. Access Concentrator Shelf PSU Voltages.

STOP. THIS PROCEDURE HAS BEEN COMPLETED.

SETTING UP SYSTEM USING SITESPAN

Within Sitespan, both the racks and the shelves must be 'built' before connecting to the Racks Do not connect Sitespan to the rack at this stage. This should be done prior to the commissioning of either the AC or CT racks.
The following steps must be followed:

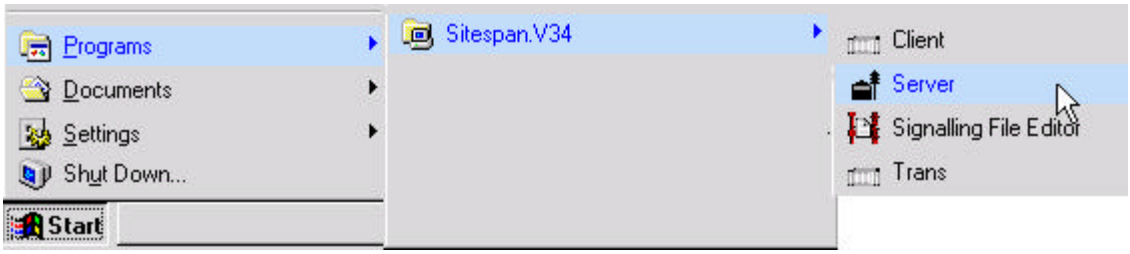
STEP **PROCEDURE**

1. Setting up Site Configuration on Sitespan

Before the system can be configured, Sitespan Version 3.4 Build 4 or later must be installed on the dedicated PC. Before installing, ensure that the PC is running Windows NT service pack 3 or later is set to run RAS and has a spare comms port or Digiport available. **Note** If the Sitespan managing an existing network is to be updated from a previous version then the current database must be updated prior to running the V3.4 version. See Appendix 4 for details of running the transfer program. For details on installing Sitespan software see the Sitespan User Guide 605-0000-426

1. Sitespan can then be started as follows:

2. Start the Server by selecting 'server' from the 'start menu' (In the 'Sitespan V34' folder, under programs)

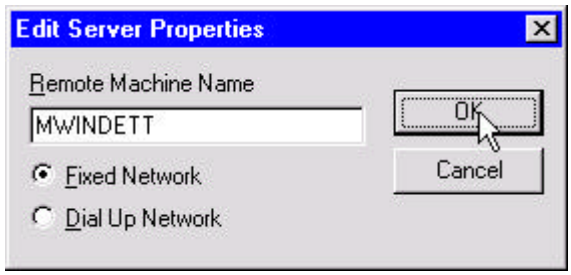


3. Start the Client by selecting 'client' from the 'start menu' (In the 'Sitespan V34' folder, under programs)

4. From the client view, open 'template.ssd' from the file menu

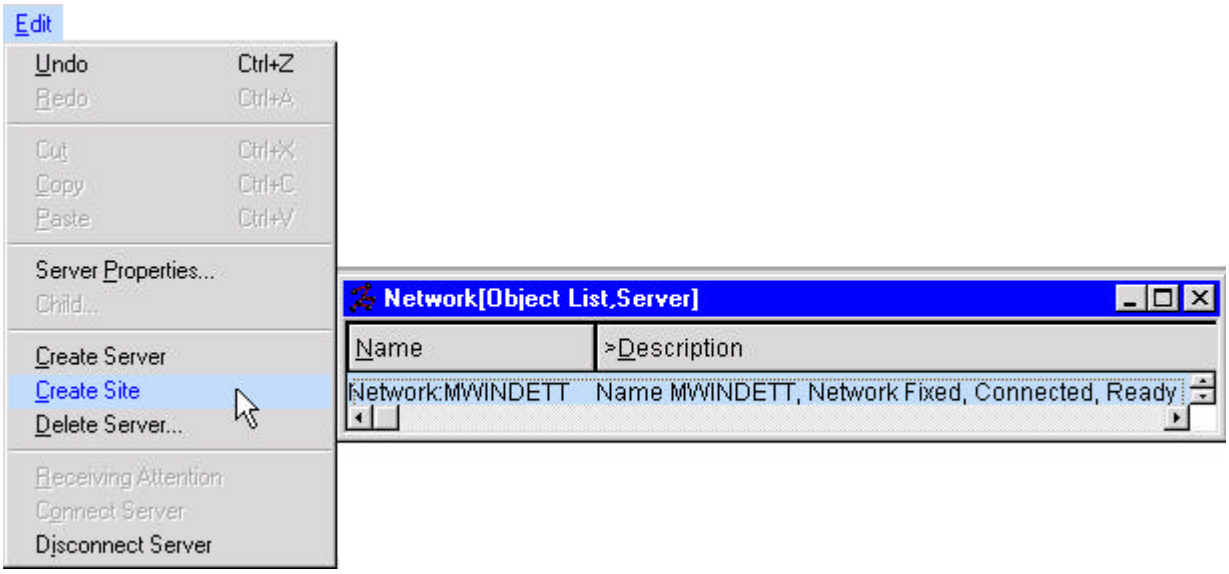
5. Highlight the 'object list, server' and 'create server' from the 'edit menu'

6. If using the fixed network, select the name of the PC that Sitespan is running on.

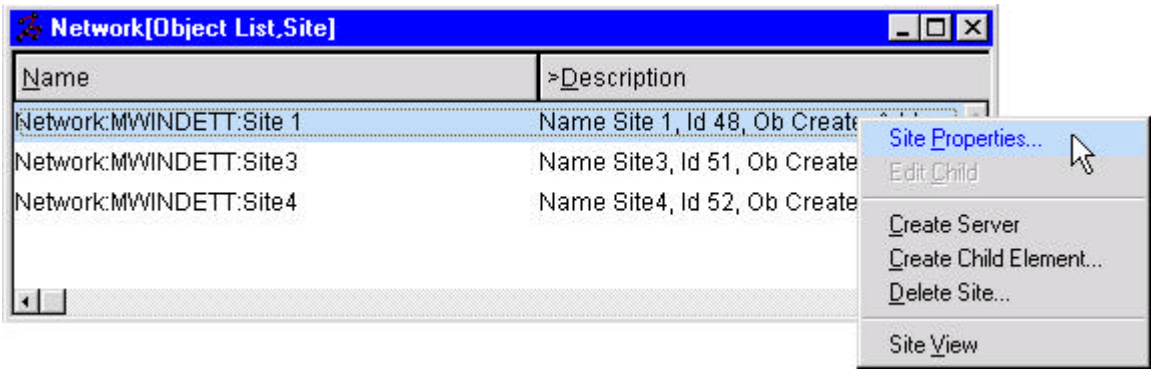


7. Connect the server from the 'edit menu'

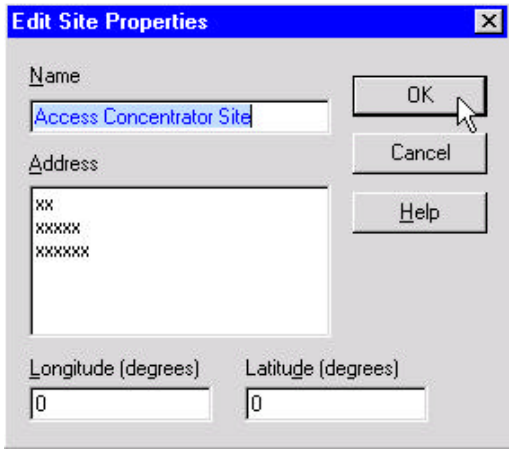
8. To create the AC Site select the server from the object list and select Create Site from the 'edit menu'



9. From the Object List, Site click right mouse button and select Site Properties



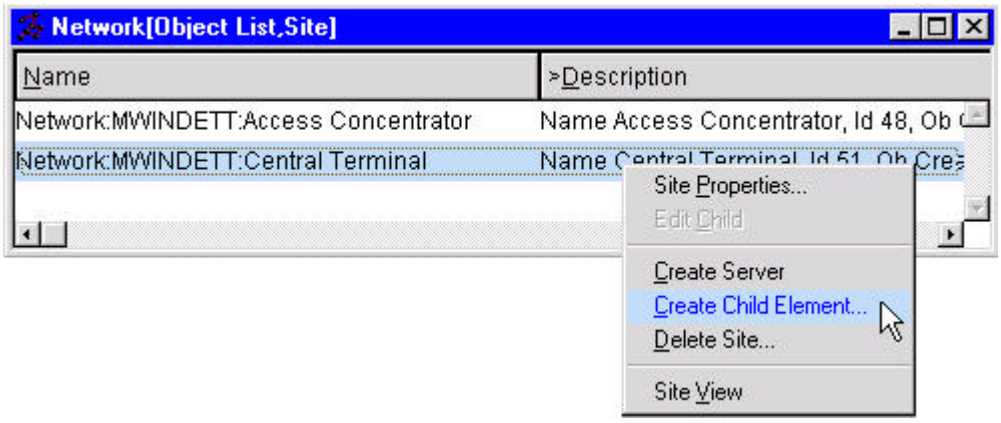
10. Enter Site Details



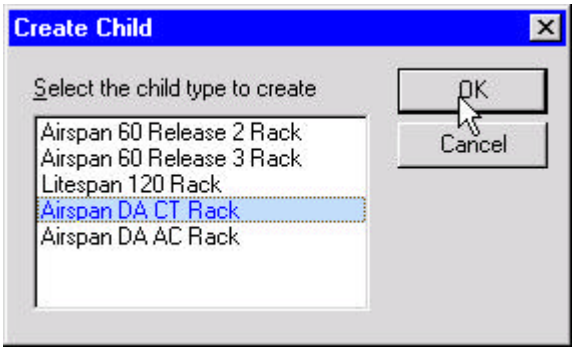
11. Repeat Steps 8-10 for each of the CT sites.

2. Setting up CT Rack and Shelf configuration on Sitespan

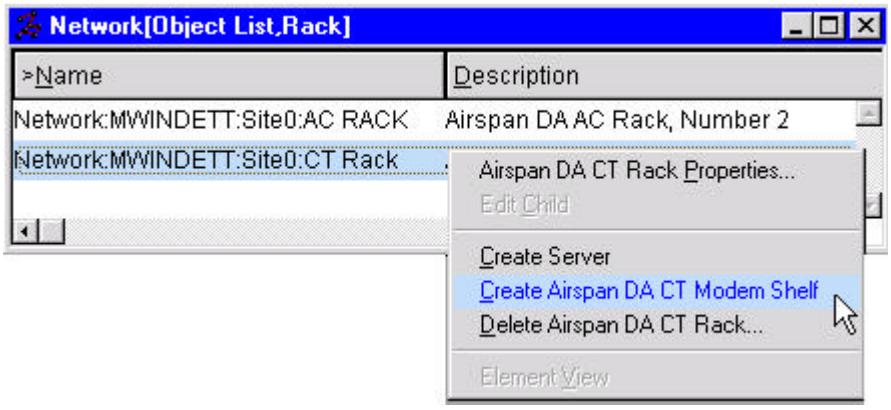
1. Highlight the site, click right mouse button and select '*Create Child Element*'



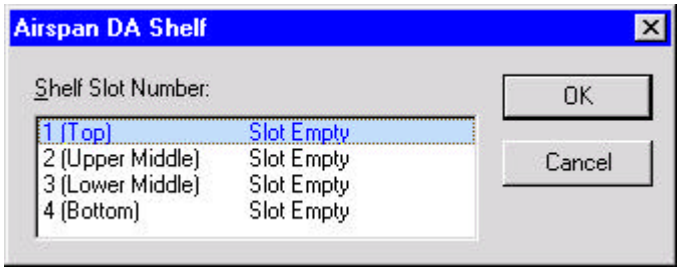
2. Select '*Airspan DA CT rack*'



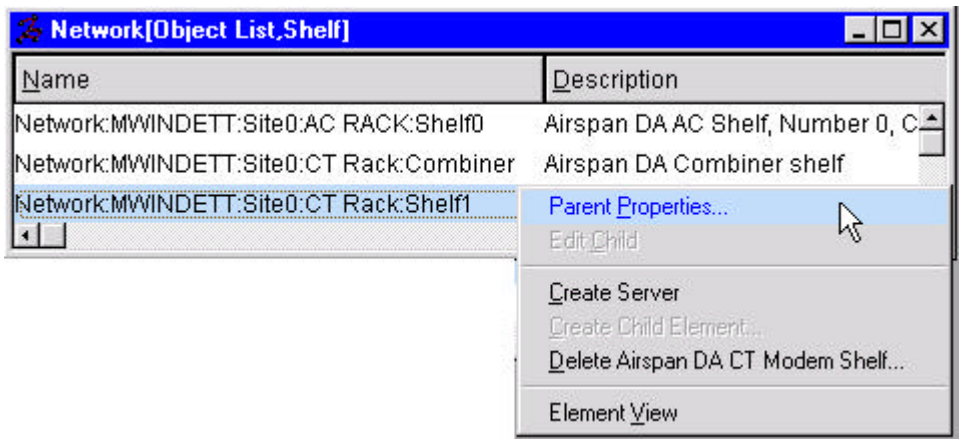
3. Highlight the rack in Object List, and create '*Airspan DA CT modem shelf*' from the 'edit menu'



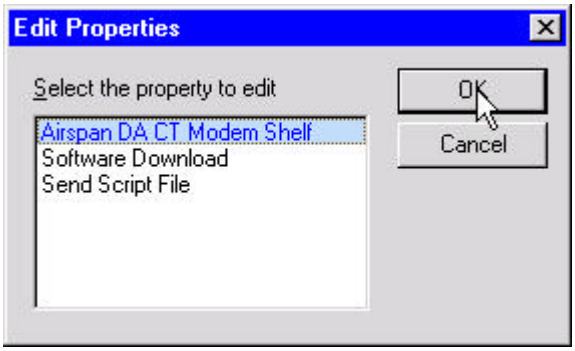
4. Select '*1 (Top)* ' (to set up modem shelf 1)



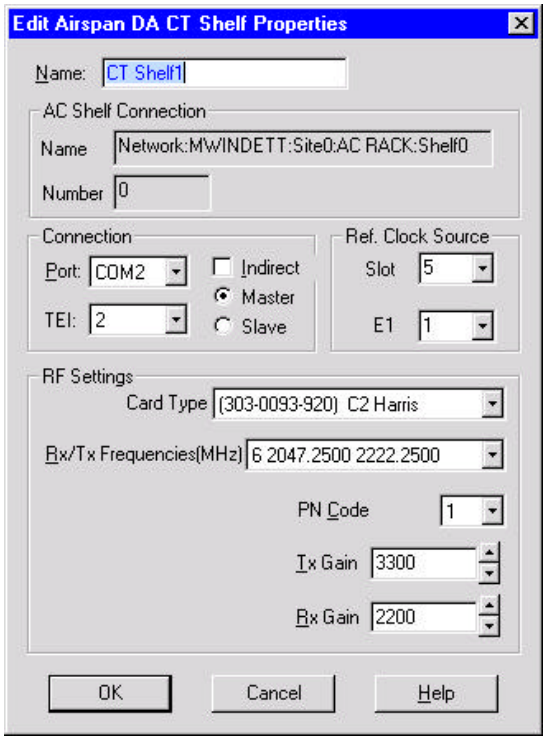
5. Highlight shelf, and edit 'parent properties'



6. Select '*Airspan DA CT Modem Shelf*'



7. Select Com port and unique TEI identifier to communicate with the AC shelf.

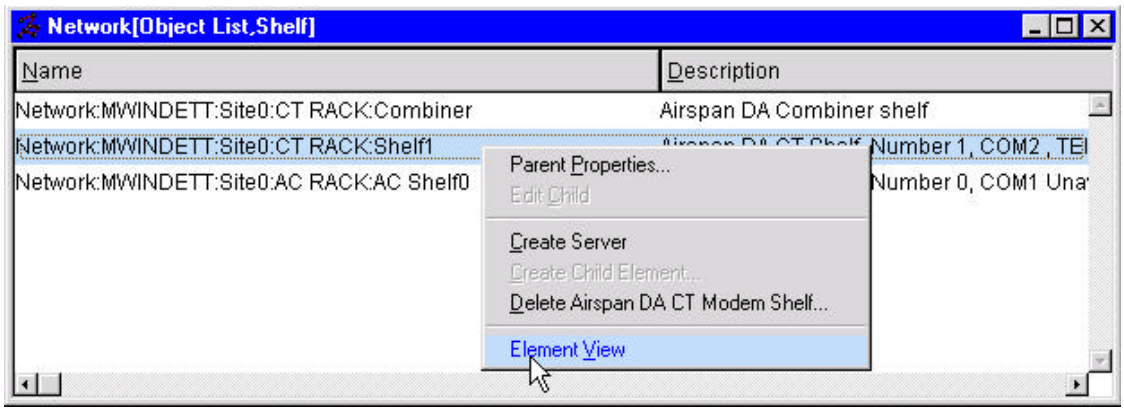


8. Set the reference clock source to the DTU connected to the CTU in the AC rack from where the clock source is derived. This is usually Slot 5 E1-1 for 75ohm Backhaul or Slot 5 E1-5 for 120ohm Backhaul. Enter the RF card type, Frequency and PN Code and set the TX gain to 3300 and the RX gain to 2200 (these are nominal values and are fine tuned when the RX sensitivity is set)

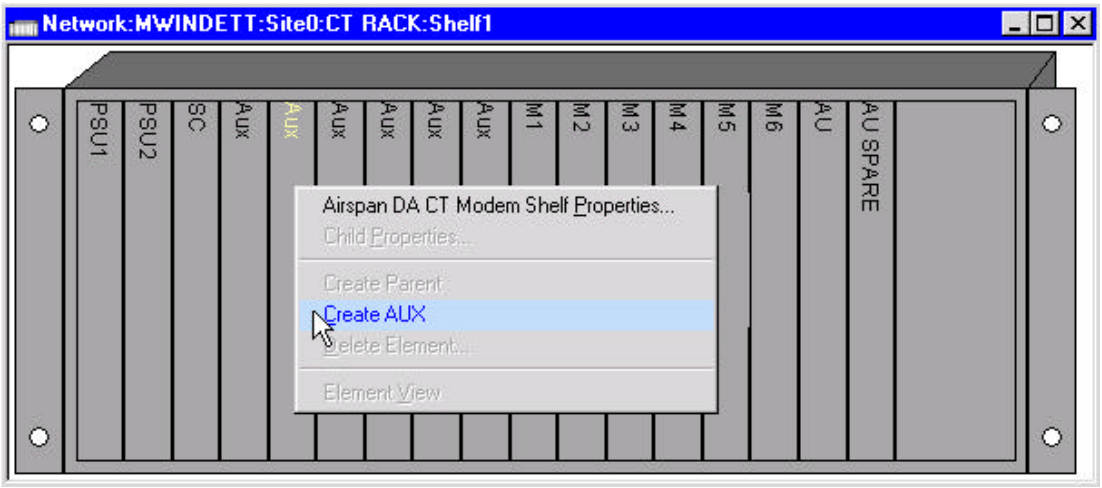
3. Assign Central terminal Card Slots

3.1. DTU Card

1. Highlight shelf, click right mouse button, click ‘element view’, and select ‘*Airspan DA CT Modem Shelf*’

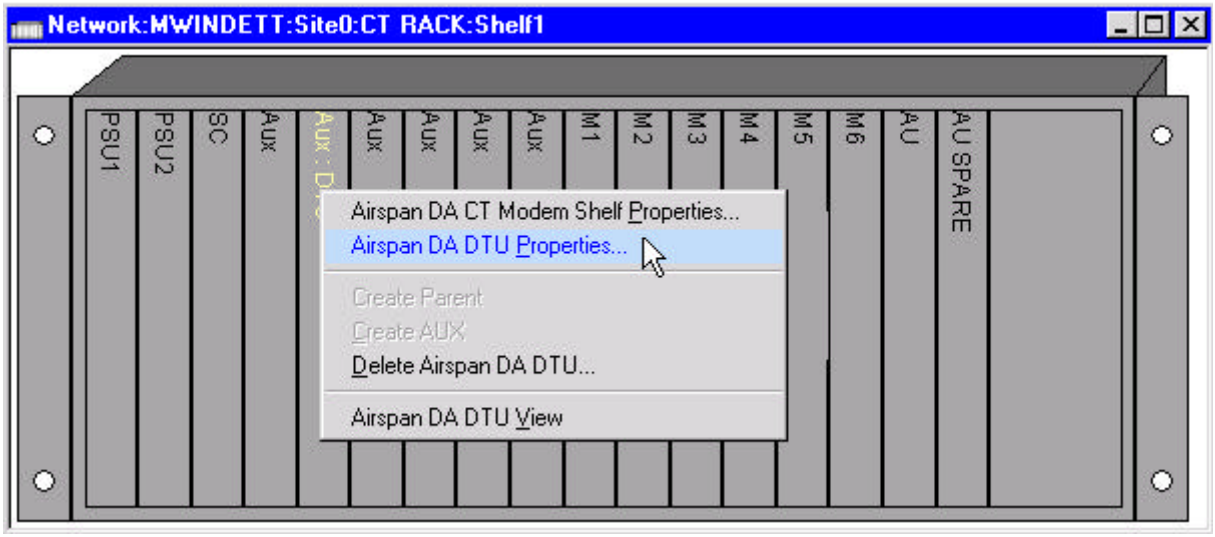


2. Highlight slot 5 for the DTU (Slot 5 is the first slot available for assigning as a DTU) and click right mouse button select 'Create Aux' from the 'edit menu'

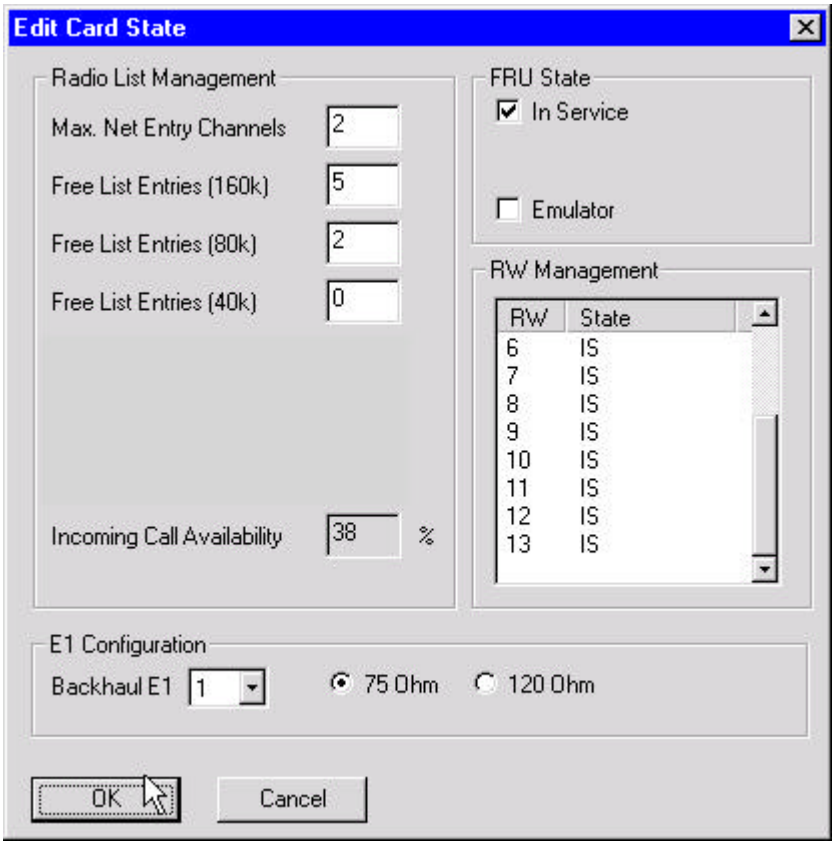


3. Select '*Airspan DA DTU*'

4. Display the shelf view and select the DTU card. Click right mouse button and select '*Airspan DA DTU Properties*'.

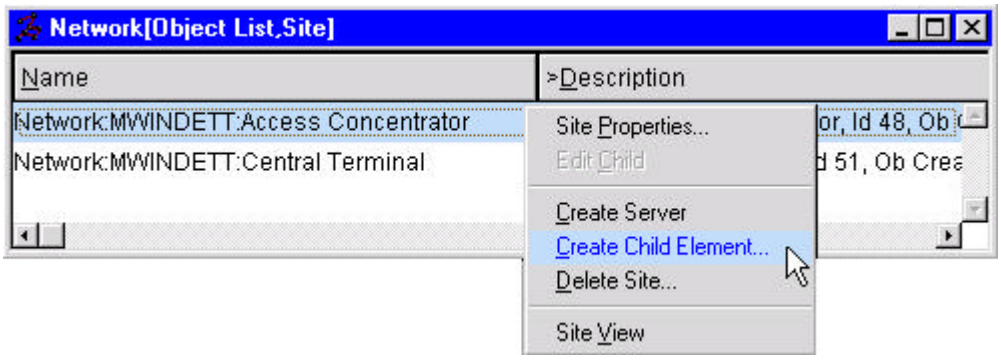


5. Set the impedance of the backhaul connections and the backhaul link used to connect the CTU and DTU. Set the Freelist entries to 5 for 160k and 2 for 80k.

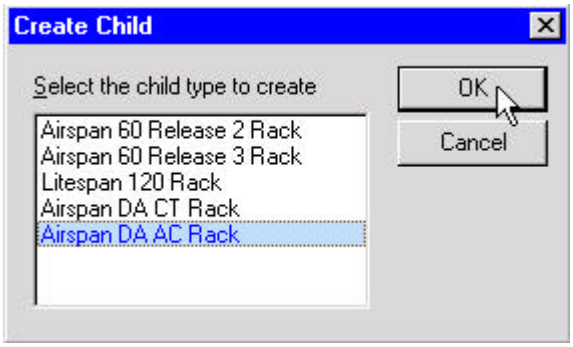


4. Setting up AC Rack and Shelf configuration on Sitespan

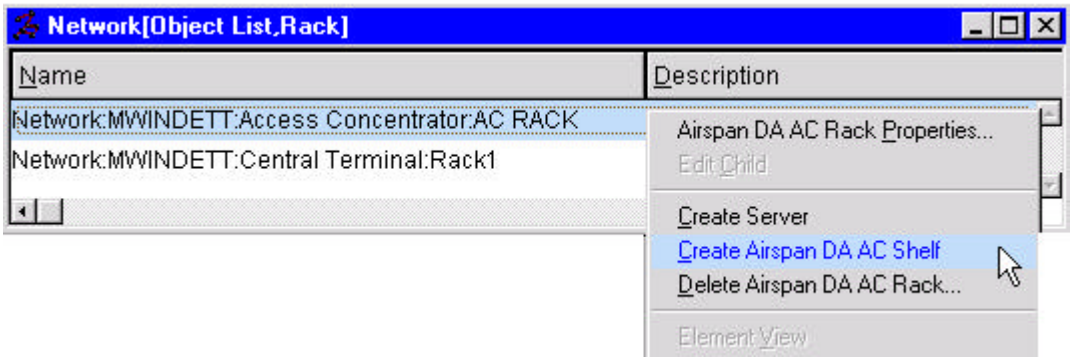
1. Highlight the site, click right mouse button and select '*Create Child Element*'



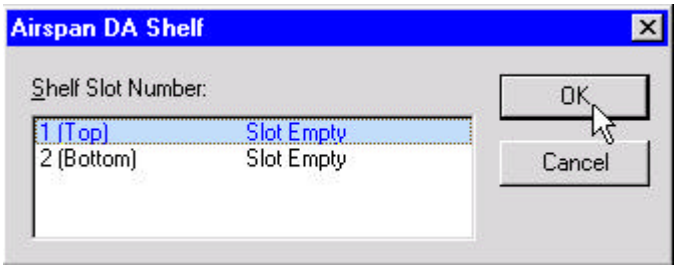
2. Select *Airspan AC Rack*



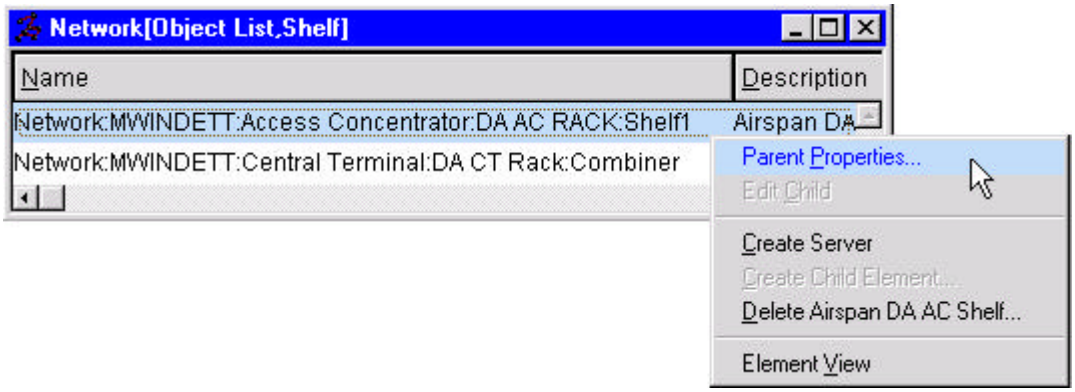
3. Highlight the rack in Object List, click right mouse button and select create '*Airspan DA AC shelf*'



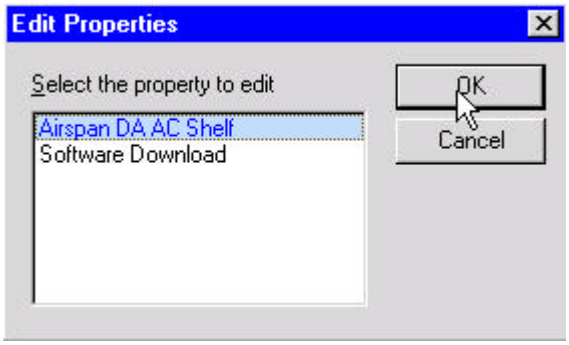
4. Select the position for the AC shelf.



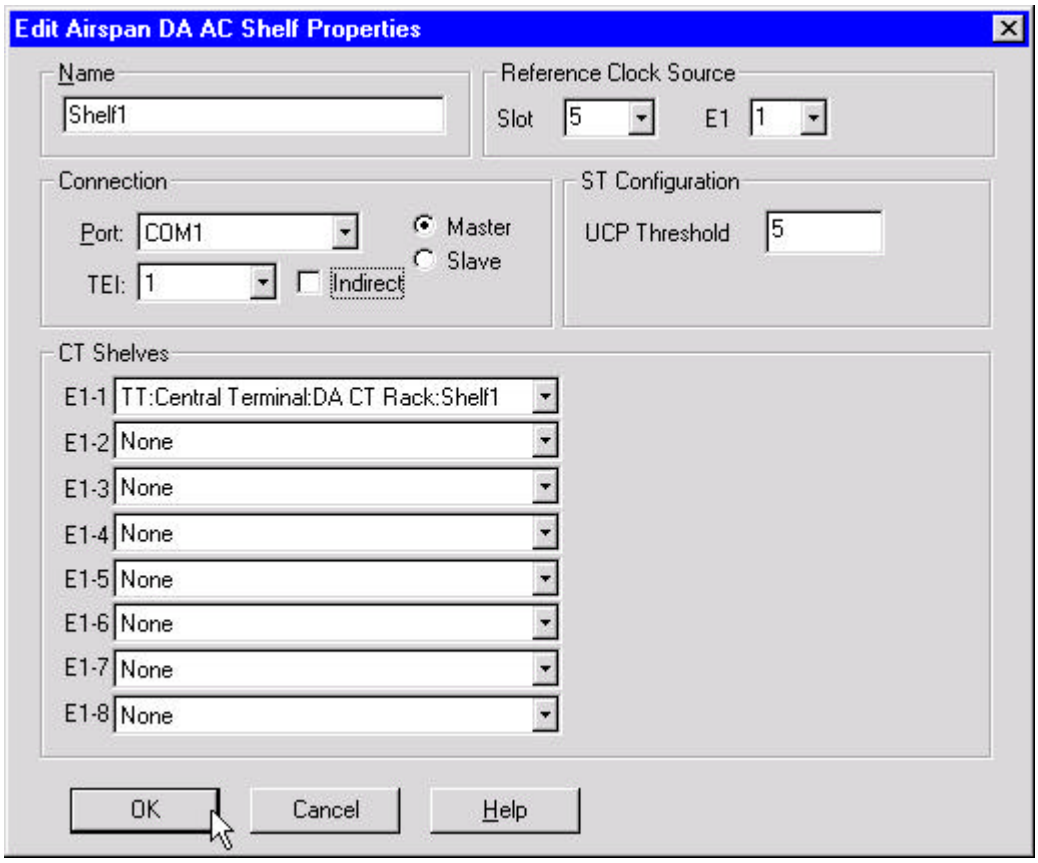
5. From the object list shelf click right mouse button and select *Parent Properties*



6. Choose *Airspan DA AC Shelf*

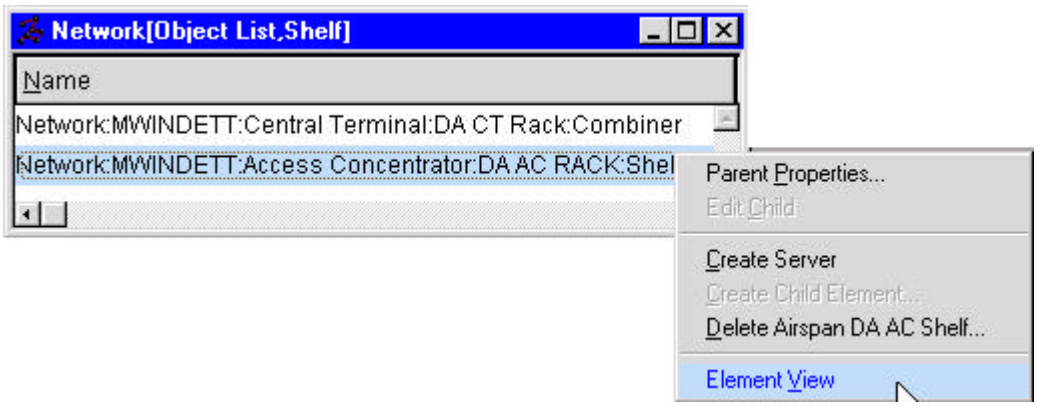


7. Enter Shelf Name, Reference Clock Source to derive timing from the network. This is usually the first E1 on the first XTU card i.e slot 5 E1-1. The Com Port is the Sitespan PC port connected to the AC shelf. The TEI must be a unique number within the system. The shelf object list shows what TEIs have been allocated to each shelf. Leave the indirect box unchecked. The UCP threshold is used to detect changes in code phase and should be set between 3-5 to avoid unnecessary alarms. The CT shelves connected to the Access Concentrator are allocated to the E1 link connecting them, drop window and select shelf.

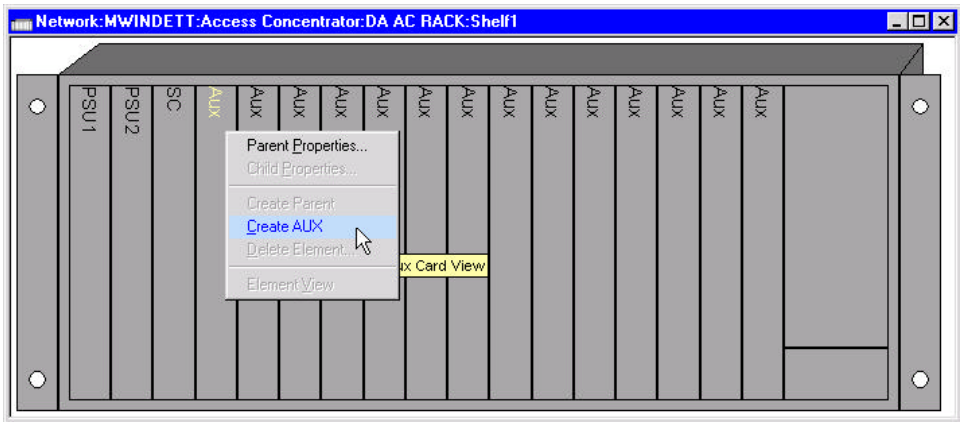


5. Assign Access Concentrator Card Slots

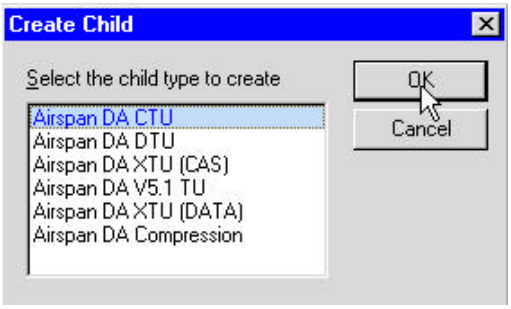
1. From Object List, Shelf select Access Concentrator, click right mouse button and select *Element View*



2. Position mouse over Aux card position to insert card, click right mouse button and select *Create AUX*



3. Select the child type to create.

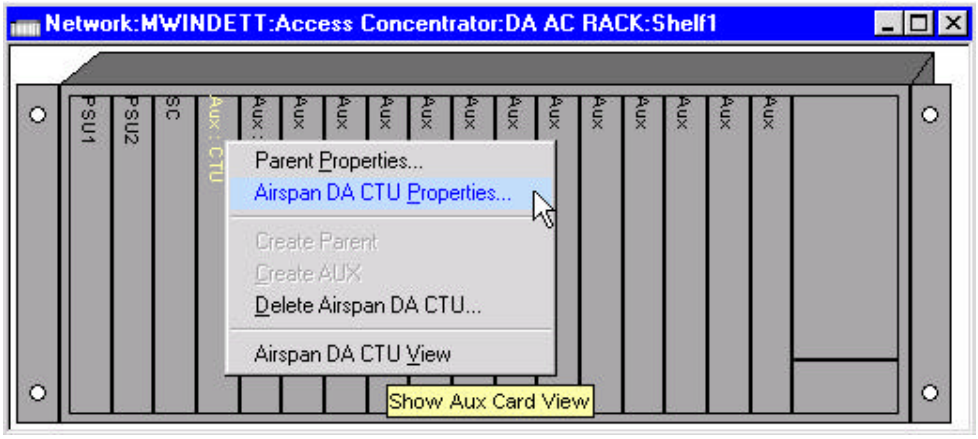


4. Repeat steps 1 to 3 for all cards to be installed in the shelf.

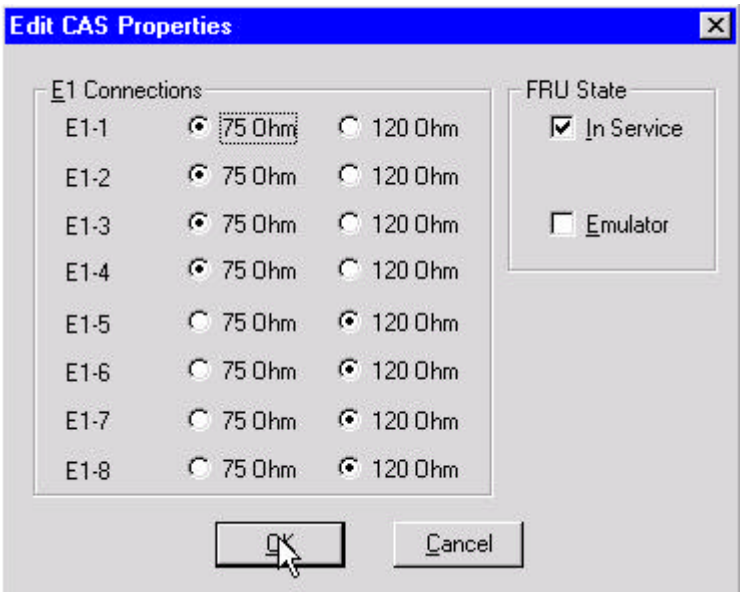
6. Configure AC Cards

6.1. CTU

1. Position mouse over CTU card position to insert card, click right mouse button and select *Airspan CTU Properties*

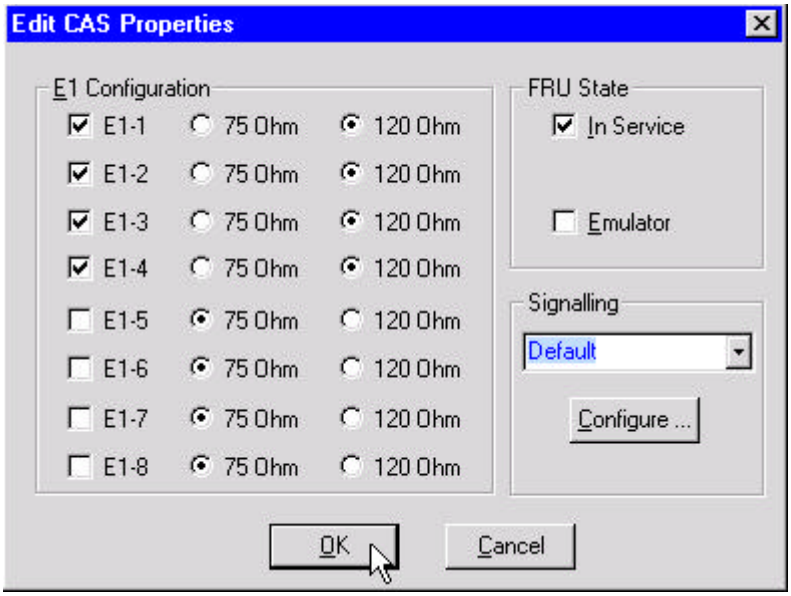


2. Select the Impedance of the E1 connections to the Central Terminal. Repeat for other CTU cards.



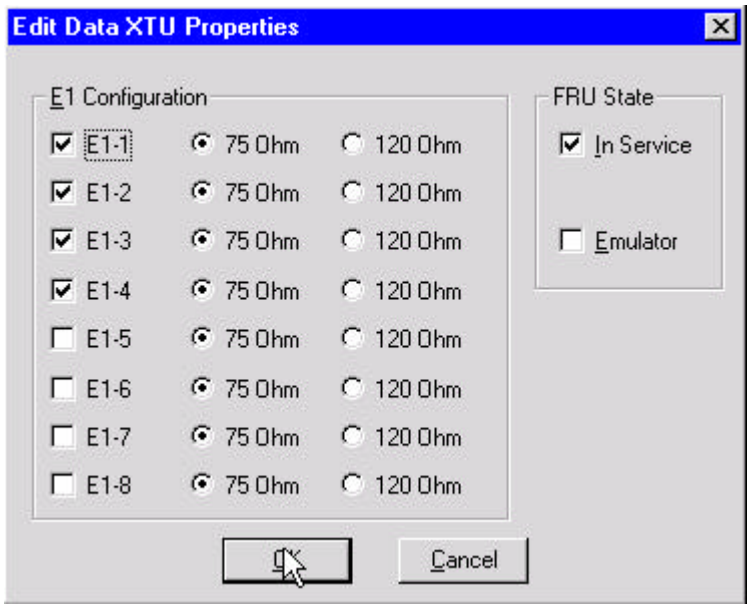
6.2. CAS

1. With Shelf view displayed. Position mouse over the CAS Card(if CAS card installed) position to insert card, click right mouse button and select *Airspan CAS Properties*. Click left mouse button in the box alongside each E1 link provisioned to the Switch. Set the impedance of each link. If special signalling features are required, click the Configure button and enter the parameters. Repeat for other CAS cards.



6.3. DATA

1. With Shelf view displayed. Position mouse over the DATA Card (if DATA card installed) position to insert card, click right mouse button and select *Airspan DATA Properties*. Click left mouse button in the box alongside each E1 link provisioned to the Switch. Set the impedance of each link. If special signalling features are required, click the Configure button and enter the parameters. Repeat for other DATA cards.

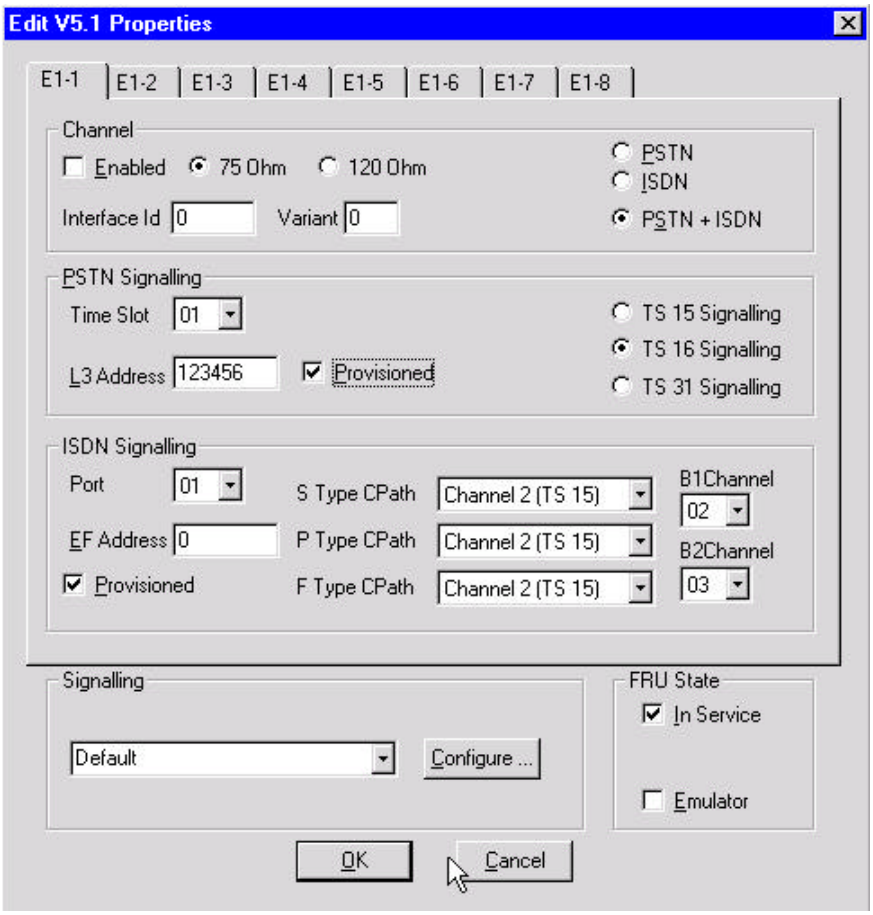


6.4. V5.1

1. With Shelf view displayed. Position mouse over the V5.1 Card (if V5.1 card installed) position to insert card, click right mouse button and select *Airspan V5.1 Properties*. Click left mouse button on each E1 linkTab provisioned to the Switch. Enable Channel, set the impedance of each link. Enter Interface ID and Variant Number (these must match those provided at the switch). Select the service type (PSTN, ISDN or Mixed).

   A) PSTN. Select the Timeslot 15,16 or 31 for signalling Each PSTN signalling Time Slot must be allocated a L3 address Number (these must also match those provided at the switch). Select each time slot in turn and enter the L3 number. If special signalling features are required, click the Configure button and enter the parameters. Repeat for other V5.1 cards.

   B) ISDN Set the port and EF addresses Number (these must match those provided at the switch). The S, P and F type Cpaths can use the sane timeslot Common Channel signalling Path as the PSTN or may use a different time slot (these must match those provided at the switch).



STOP. THIS PROCEDURE HAS BEEN COMPLETED.

SHELF CONTROLLER SOFTWARE DOWNLOADS

STEP **PROCEDURE**

The SC must be loaded with the latest Shelf Controller and TU software to ensure that the cards operate correctly. All the software for the cards in the shelf is downloaded and stored in the SC card. All of the software versions are downloaded to the SC irrespective of whether the SC is an AC SC or a CT SC. This is useful for fault finding

1. Before downloading the latest software it **must** be placed in the 'download' directory created in the root directory on the Sitespan PC when Sitespan was installed. The SC is capable of storing two sets of configuration files

2. Connect the Access Concentrator shelf to Sitespan (ensuring the cable is connected to selected com port)

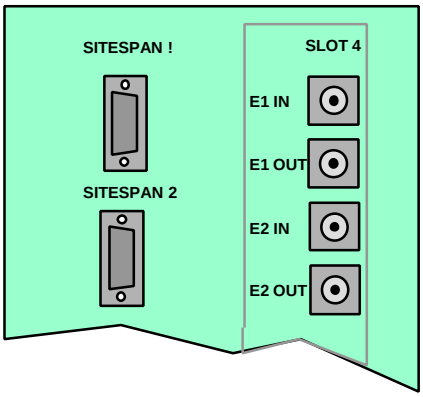
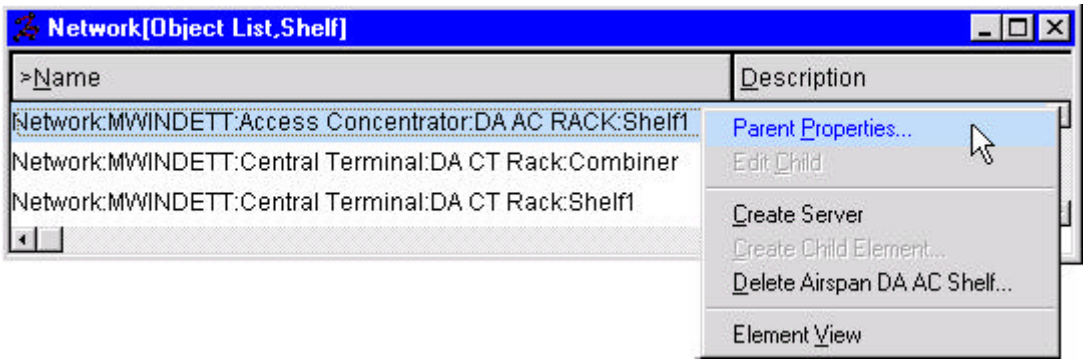
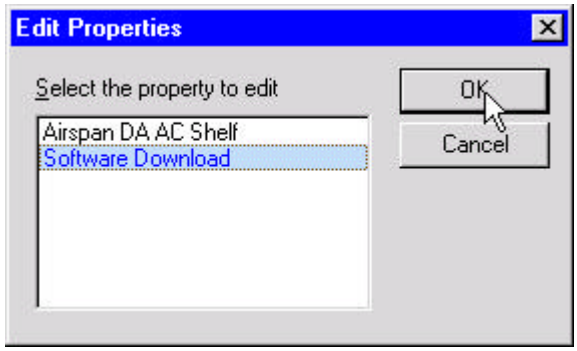


Figure 18. Access Concentrator Shelf Backplane

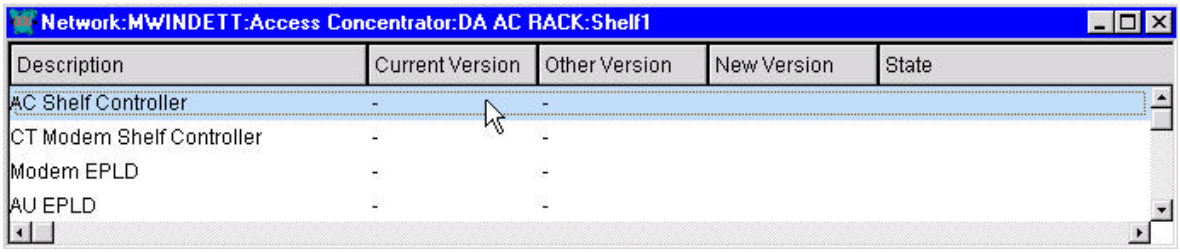
3. The following procedure must be followed on Sitespan to download the software to the SC card: Highlight shelf, click right mouse button and edit '*Parent Properties*'.



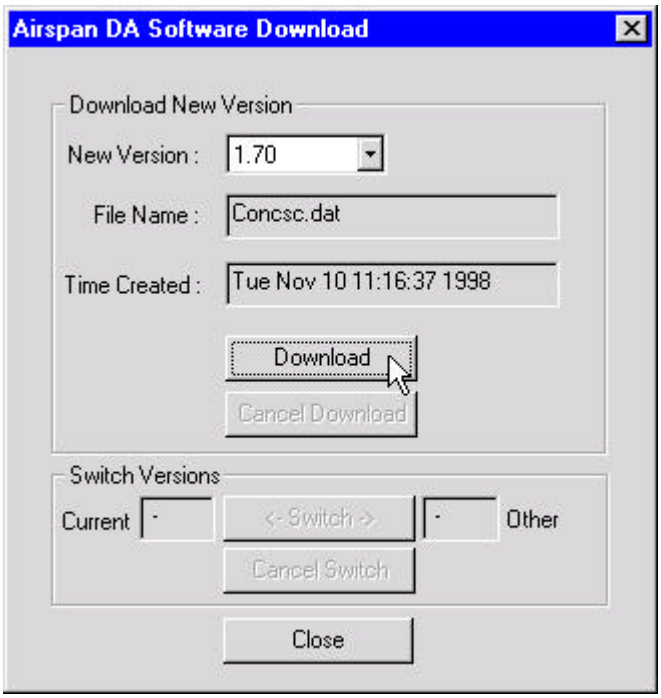
4. Select 'Software Downloads'



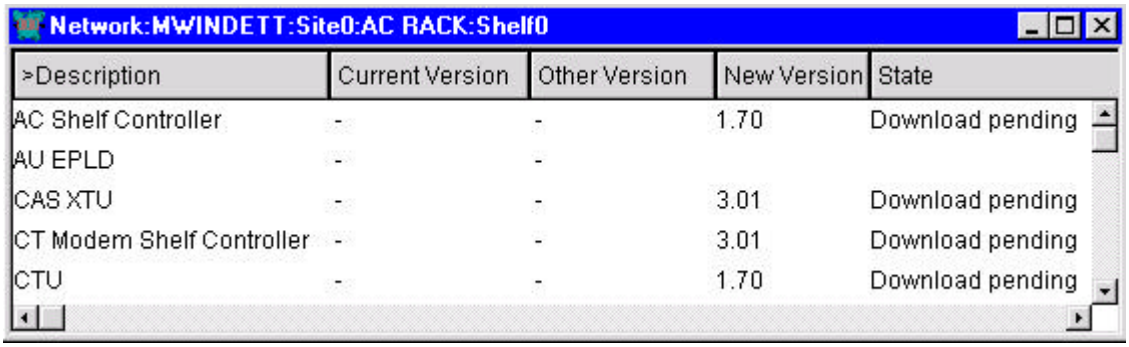
5. 'Double click' item of software to download.



6. Check that the version for download is the latest version, select 'download'.



7. Repeat steps 5 and 6 for all the software files to be loaded. Download progress is shown on the main software download screen. Files waiting to be downloaded will show Download pending in the object list.



8. Wait for the download to complete which could take several hours.

9. Once the software downloads are complete reset by 'hot plugging' the Shelf Controller Card

10. All the cards on the modem shelf now boot-up.

11. The TU cards l display the following LED sequence:

    Note: The boot-up procedure for these cards takes approximately 15minutes.

    a) Red LED, amber LEDs & green surface mount LEDs all ON. Green LED FLASHING
    b) Red LED ON, green LED FLASHING, amber LEDs OFF & green surface mount LEDs showing download progress.
    c) Green LED ON, green surface mount LEDs indicate card configuration as shown below

LED	DTU
1 Top	OFF
2	OFF
3	ON
4 Bottom	OFF

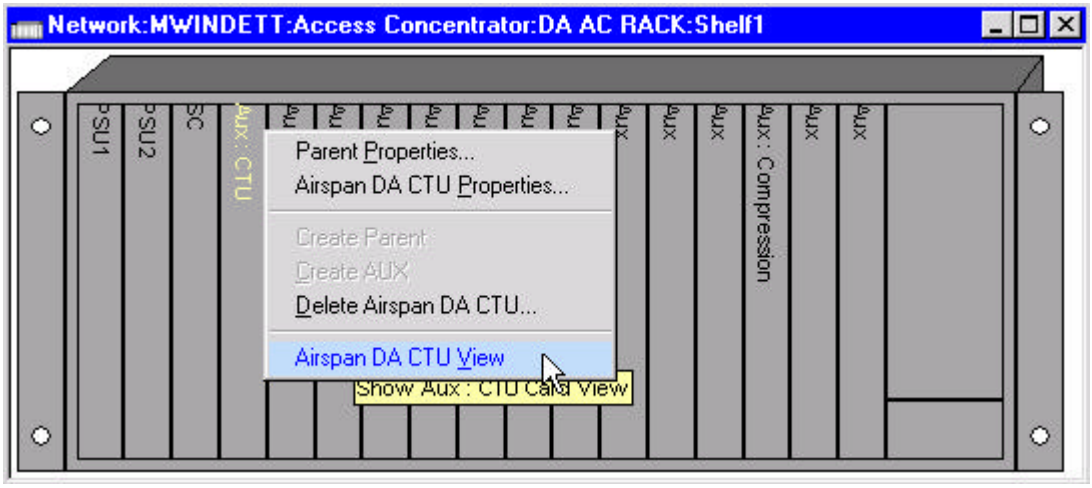
12. The rest of the cards displays the following LED sequence:

    Note: The boot-up procedure for these cards takes a couple of minutes

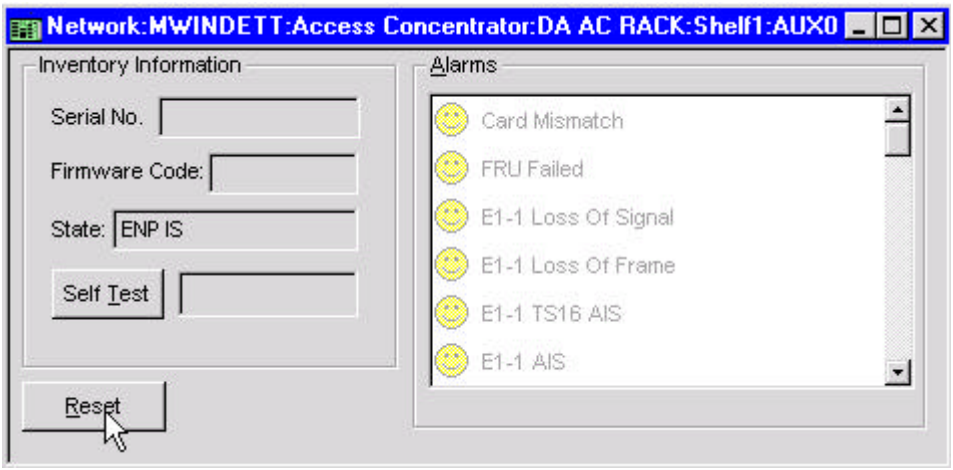
    a) Red LED ON & green LED FLASHING
    b) Green LED ON

13. If the cards do not boot-up correctly, which is indicated if any of the cards display a flashing red or continuous red LED only, follow the procedure in Appendix 3

14. Each card must be reset from Sitespan. Select card on shelf view 'double click' the card, or click right mouse button and select *Airspan (card type) View*



15. Click *Reset* button to reset



CONFIGURING THE ACCESS CONCENTRATOR

STEP **PROCEDURE**

1. Configure the Access Concentrator

1. Select the Access Concentrator to be configured.

2. Connect the Access Concentrator shelf to Sitespan (ensuring the cable is connected to selected com port)

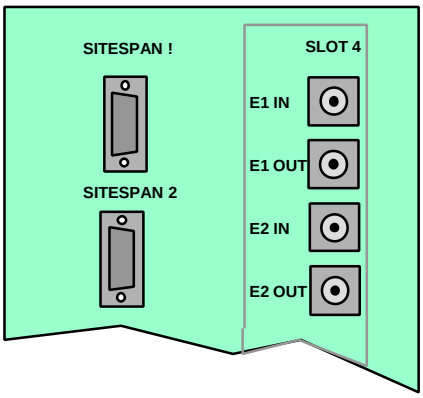


Figure 19. Access Concentrator Shelf Backplane

3. Re-boot the Shelf Controller card by 'Hotplugging.

4. SC card boots-up and displays the following LED sequence:

    a) Red & green LEDs both ON
    b) All LEDs OFF
    c) Green LED FLASHING
    d) Green LED ON
    e) The red LED temporarily comes ON

5. All the cards on the shelf now boot-up.

6. The TU cards l display the following LED sequence:

    Note: The boot-up procedure for these cards takes approximately 15minutes.

    d) Red LED, amber LEDs & green surface mount LEDs all ON. Green LED FLASHING

e) Red LED ON, green LED FLASHING, amber LEDs OFF & green surface mount LEDs showing download progress.
f) Green LED ON, green surface mount LEDs indicate card configuration as shown below

LED	DTU	XTU
1 Top	OFF	ON
2	OFF	OFF
3	ON	OFF
4 Bottom	OFF	OFF

7. The rest of the cards displays the following LED sequence:

   Note: The boot-up procedure for these cards takes a couple of minutes

   c) Red LED ON & green LED FLASHING
   d) Green LED ON

8. If the cards do not boot-up correctly, i.e. any of the cards display a flashing red or continuous red LED only, follow the procedure in Appendix 2

2. Alarm and Status Indications (Test 3)

1. Verify that the alarms and status indications (LED's) on the system comply with those detailed in the following tables.

   Note: The following tables are set in order of appearance on the front of the card reading from top to bottom.

TU8			
Position	**Colour**	**Description**	**Status**
TOP 1	Red	Card failure LED, which shall be alight if the card self test fails, or if commanded by the SC.	OFF
2	Green	Card busy LED, to indicate live traffic is present and should not be removed.	ON
3	Red/yellow	E1 port 1 Alarm	*
4	Red/yellow	E1 port 2 Alarm	*
5	Red/yellow	E1 port 3 Alarm	*
6	Red/yellow	E1 port 4 Alarm	*
7	Red/yellow	E1 port 5 Alarm	*
8	Red/yellow	E1 port 6 Alarm	*
9	Red/yellow	E1 port 7 Alarm	*
10	Red/yellow	E1 port 8 Alarm	*

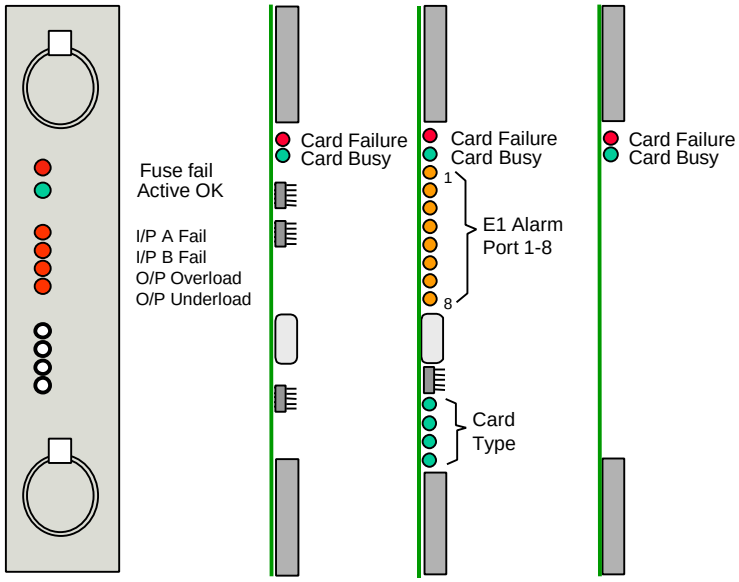
LED Yellow if 2Mbit/s is not being sent, Red if 2Mbit/s not received.

CU			
Position	**Colour**	**Description**	**Status**
TOP 1	Red	Card failure LED, which shall be alight if the card self test fails, or if commanded by the SC.	OFF
2	Green	Card busy LED, to indicate live traffic is present and should not be removed.	OFF

SC			
Position	**Colour**	**Description**	**Status**
TOP 1	Red	Card failure LED, which shall be alight if the card self test fails	OFF
		OK Card is Active.	

PSU			
Position	**Colour**	**Description**	**Status**
TOP 1	Red	FUSE FAIL: Illuminated if either input fuse has blown.	OFF
2	Green	OK Card is Active.	ON
3	Red	I/P A FAIL input voltage A (BATTNEG0) not present	OFF
4	Red	I/P B FAIL input voltage B (BATTNEG1) not present	OFF
5	Red	O/P OVERLOAD.	OFF
6	Red	O/P UNDERLOAD	OFF

Table 8. Access Concentrator Shelf Card LED Indications.



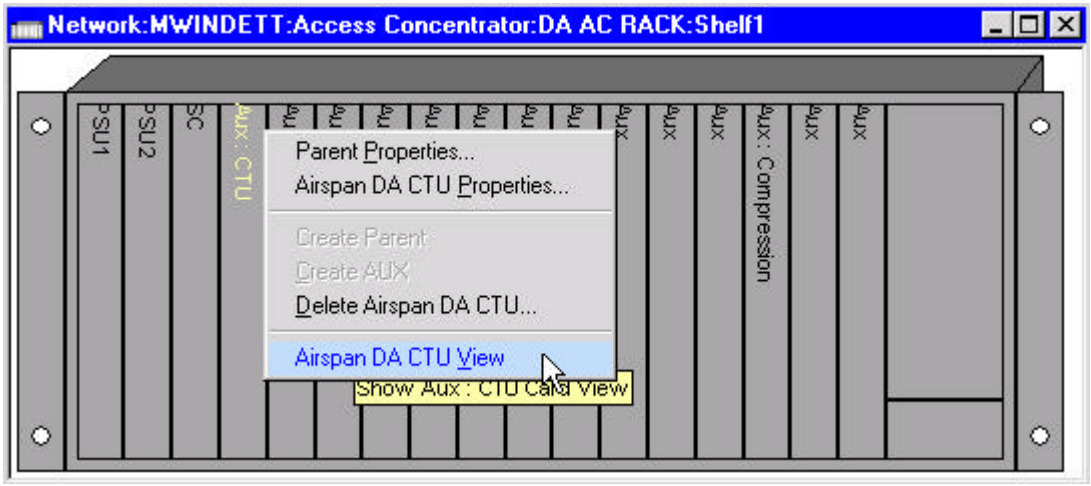
Note: LED function detailed in Table 8.

STEP **PROCEDURE**

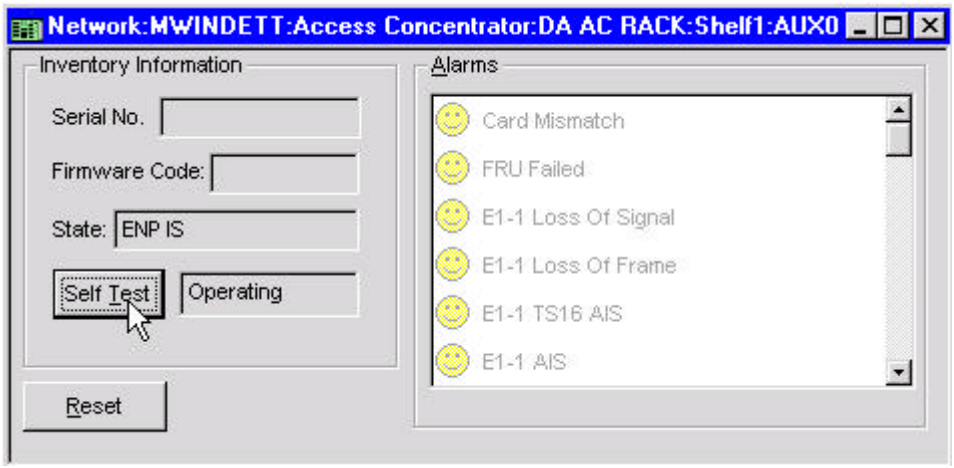
3. Self Test (Test 4)

1. Execute the self test function (using Sitespan) on each card and ensure that it passes. Replace any faulty cards.

16. Select card on shelf view ‘double click’ the card, or click right mouse button and select *Airspan (card type) View*



17. Click *Self Test* button to reset. Check that each card passes



18. This concludes the setting up at the access concentrator. The CT site can now be commissioned

STOP. THIS PROCEDURE HAS BEEN COMPLETED.

This Page Intentionally Blank

COMMISSIONING TEST RESULTS

1. Commissioning Test Results

Please photocopy test results sheet for use with each system

1.1. Test Equipment Calibration

Item	Description	Model	Serial No	Calibration Date
1	Digital Multimeter			

CUSTOMER:.....
SITE LOCATION: .....
RACK ID: .....
ENGINEER:.....
DATE:.....

ACShelf 1	**Card Type**	**Serial Number**	**Rev Level**
PSU 1	PSU		
PSU 2	PSU		
SC	SC		
AUX 1			
AUX 2			
AUX 3			
AUX 4			
AUX 5			
AUX 6			
AUX 7			
AUX 8			
AUX 9			
AUX 10			
AUX 11			
AUX 12			
AUX 13			
AUX 14			

ACShelf 1	**Card Type**	**Serial Number**	**Rev Level**
PSU 1	PSU		
PSU 2	PSU		
SC	SC		
AUX 1			
AUX 2			
AUX 3			
AUX 4			
AUX 5			
AUX 6			
AUX 7			
AUX 8			
AUX 9			
AUX 10			
AUX 11			
AUX 12			
AUX 13			
AUX 14			

Rack ID.....

PARA	TASK / TEST		LIMIT	RESULT
	Site Inspection & Verification			
	2 Mbit/s Cabling	AC Shelf 1		
		AC Shelf 2		
	System Commissioning Tests			
	Test 1a Exchange DC Voltage Supply 1		-21.8 to -60.0V DC	
	Supply 2			
	Test 1b Exchange DC Voltage Supply 1		-21.8 to -60.0V DC	
	Supply 2			
	Test 2 AC Shelf 1 PSU1		5V DC ± 250mV 3.3V DC +0mV-300mV 2.1V DC+0mV-100mV	
	Test 2 AC Shelf 1 PSU2		5V DC ± 250mV 3.3V DC +0mV-300mV 2.1V DC+0mV-100mV	
	Test 2 AC Shelf 2 PSU1		5V DC ± 250mV 3.3V DC +0mV-300mV 2.1V DC+0mV-100mV	
	Test 2 AC Shelf 2 PSU2		5V DC ± 250mV 3.3V DC +0mV-300mV 2.1V DC+0mV-100mV	

PARA.	TASK / TEST		LIMIT	RESULT
	Power Up and Self Test			
	Test 3 AC Shelf 1 Alarms and Indications	PSU 1 PSU 2 SC Card Aux Cards (if fitted)		Pass /Fail
	Test 3 AC Shelf 2 Alarms and Indications	PSU 1 PSU 2 SC Card Aux Cards (if fitted)		

Rack ID…..

PARA.	TASK / TEST		RESULT
	Test 4 AC Shelf 1 System Configuration Self test from Sitespan	SC Card AUX 1 AUX 2 AUX 3 AUX 4 AUX 5 AUX 6 AUX 7 AUX 8 AUX 9 AUX 10 AUX 11 AUX 12 AUX 13 AUX 14	
	Test 4 AC Shelf 2 System Configuration Self test from Sitespan	SC Card AUX 1 AUX 2 AUX 3 AUX 4 AUX 5 AUX 6 AUX 7 AUX 8 AUX 9 AUX 10 AUX 11 AUX 12 AUX 13 AUX 14	

SITE ACCEPTANCE

1. Site Inspection

Check all work areas are free of debris i.e. cable off-cuts, braid, dust and packaging and that the site is as found.

2. Site Acceptance Forms

ACC and customer copies of site acceptance forms are provided on the following pages.

This page left blank.

AS4000- ACCESS CONCENTRATOR ACCEPTANCE FORM

CONTRACT OR CUSTOMER'S REF. NO:.....

AS4000 COMMUNICATIONS CORPORATION LTD REF. NO:.....

SITE IDENTITY:.....

The Customer accepts that the following equipment has been supplied, installed and tested.

.....
.....
.....

Customer Representative
Name:_____ **Position:**_____ **Date:**_____ **Signature:**_____
ACC Representative
Name:_____ **Position:**_____ **Date:**_____ **Signature:**_____

ACC COPY

This page left blank.

AS4000- ACCESS CONCENTRATOR ACCEPTANCE FORM

CONTRACT OR CUSTOMER'S REF. NO:.....

AS4000 COMMUNICATIONS CORPORATION LTD REF. NO:.....

SITE IDENTITY:.....

The Customer accepts that the following equipment has been supplied, installed and tested.

.....
.....
.....

Customer Representative
Name:_____ **Position:**_____ **Date:**_____ **Signature:**_____
ACC Representative
Name:_____ **Position:**_____ **Date:**_____ **Signature:**_____

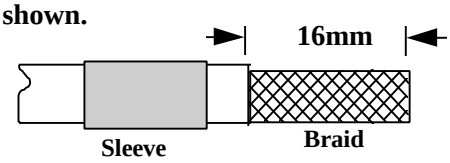
CUSTOMER COPY

This Page Left Blank

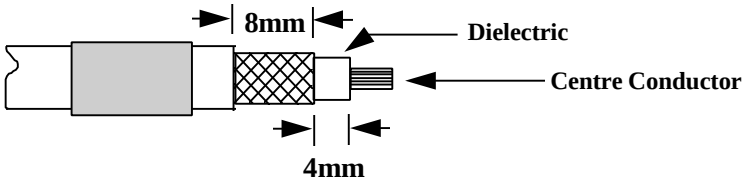
APPENDIX 1

Appendix 1 BNC Terminations to Coax

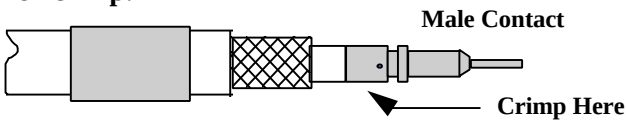
1. **Slide metal crimp sleeve over cable,trim outer sheath from cable as shown.**



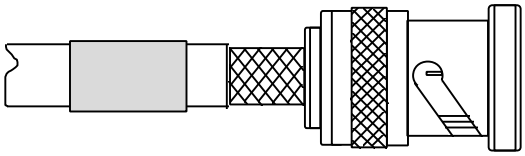
2. **Trim back braid and dielectric to the dimensions as shown.**



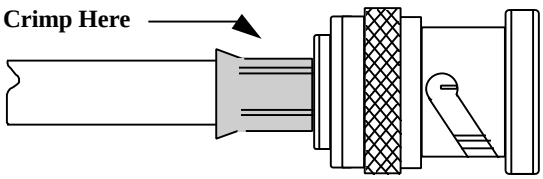
3. **Fit contact over the centre conductor to butt against the dilectric, then crimp.**



4. **Press sub-assembly into body, until contact clicks into place and ensuring that the knurled ferrule is inserted between the dilectric and braid**



5. **Slide the sleeve along the cable, until it butts against the body sub-assembly. Crimp using VQ die.**



This Page Intentionally Blank

PROCEDURE IN CASE OF CARD BOOT-UP FAILURE

Procedure in case of card boot-up failure

If the cards inserted into the shelf do not boot-up, the top red LED on the card will be either continuously ON or FLASHING. The following steps should be followed:

1. Check cards are properly inserted into the shelf, in the correct positions.
2. Reset the SC card using Sitespan, under the card view.
3. The cards boot-up. If the cards do not boot-up try and reset the shelf backplane configuration. Download the SetTUinv.txt to the SC. Ensure they are available before continuing.
4. Disconnect Sitespan from the shelf containing cards that will not boot-up.
5. Connect the LAT cable to the SC card
6. Send the text files for the correct shelf, one after another using Terminal.
7. Once completed, type the following:

   TI 118

   EA 118:0/119:0

   ES 0

8. Wait 2 – 3 minutes for the process to complete.
9. Reset the SC by shorting Pins 2 & 3
10. Wait for 3 minutes: After 3 minutes the Shelf Controller has a green LED ON, and all the other cards have FLASHING red LEDs
11. Re-Connect Sitespan
12. The cards on the shelf boot-up. If the cards do not boot-up, then it is likely that one of the cards is faulty. Try replacing one of the cards and starting the procedure again.

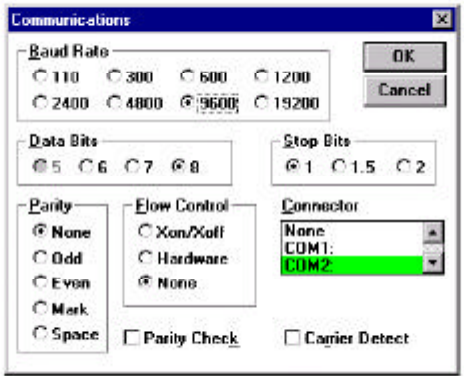
NOTE: Try swapping the SC cards between the AC and the CT shelf, because all the latest software should be installed on both cards. This way it is easy to tell if the SC card is faulty or not.

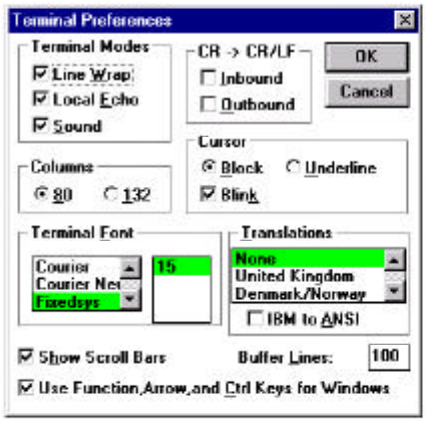
This Page Intentionally Blank

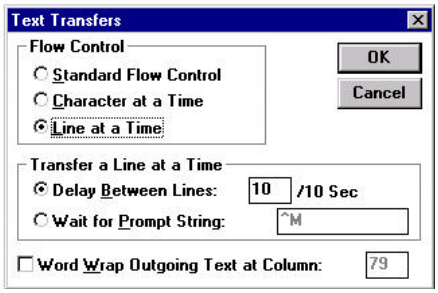
LAT SETTINGS

1. LAT connected to SC

The following pictures show the Terminal Settings used when connecting a LAT terminal to the Shelf Controller:







This Page Intentionally Blank

SITESPAN DATABASE TRANSLATION V2.5 TO V3.4

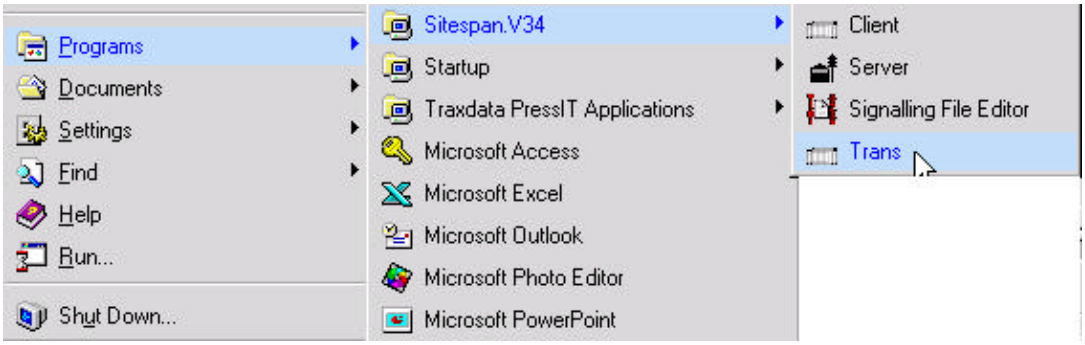
1. Close down all Sitespan Client/Server applications running on the network.

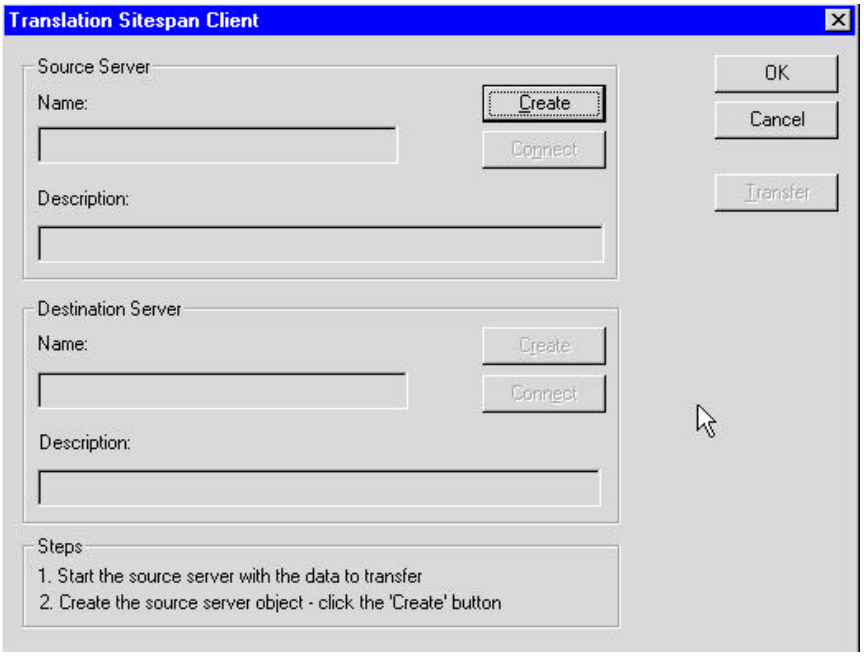
2. Ensure that the server25.olg & server25.svd files are located on the root C: drive of your PC.

3. Ensure that server34.olg & server34.svd files **DO NOT** exist on the root C: drive of your PC.

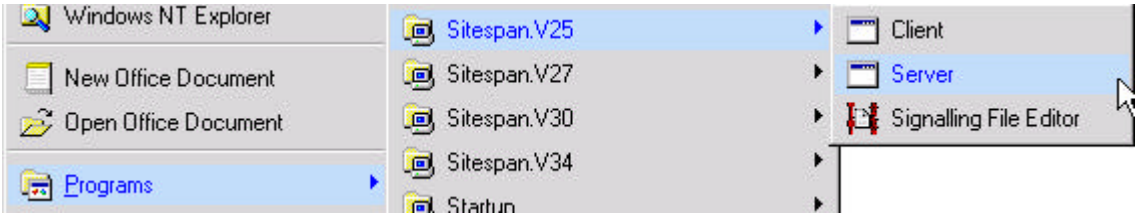
4. If there is a server34.olg or server34.svd file in the directory then delete it/them.

5. Run the Sitespan V3.4 "trans" program

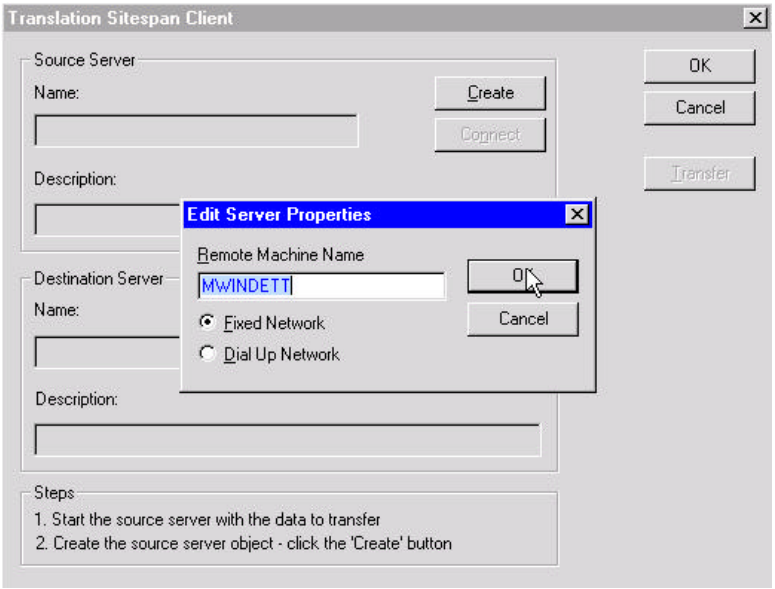




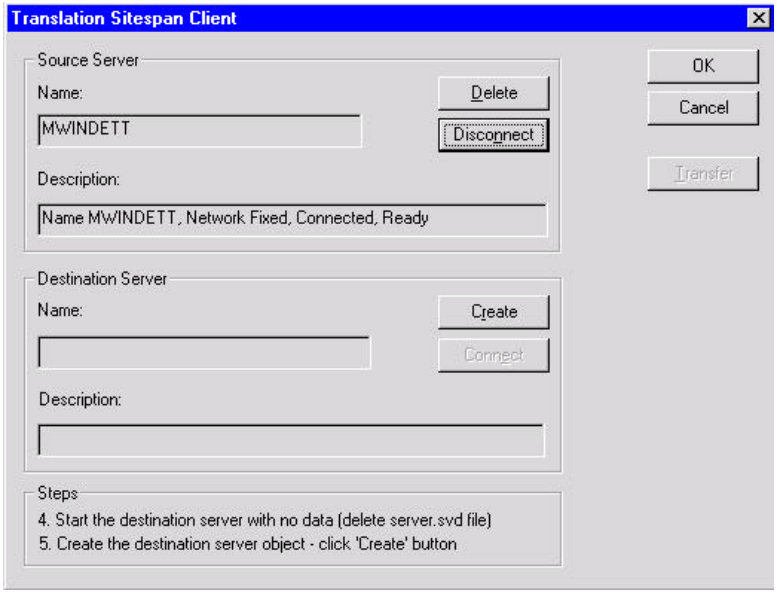
6. Run the Sitespan Server for Sitespan V2.5



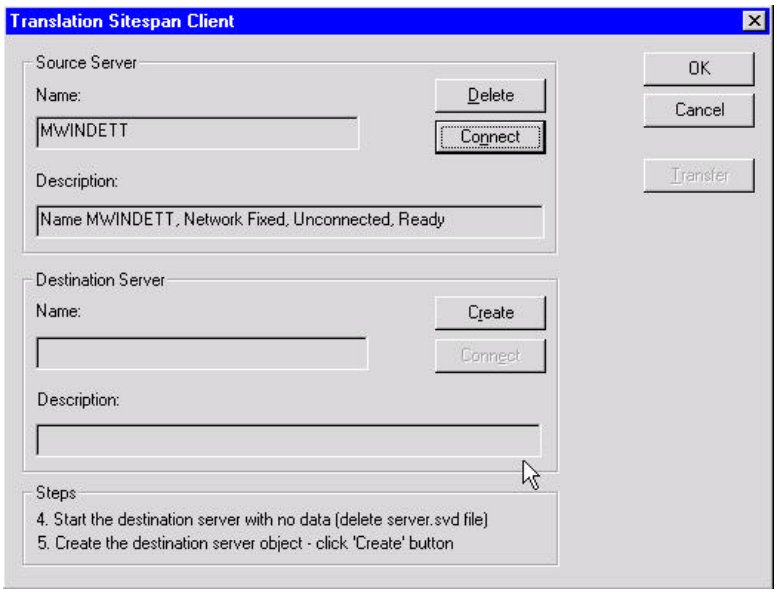
7. In the "Trans" program connect to the V2.5 Server by selecting "Create" and Select OK when asked to connect to the Remote Machine Name



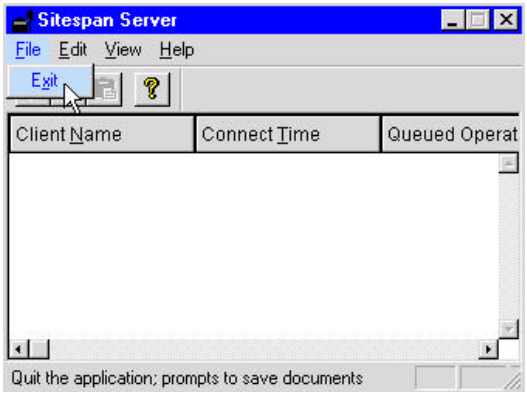
8. The Source Server will then indicate that it is Connected and Ready



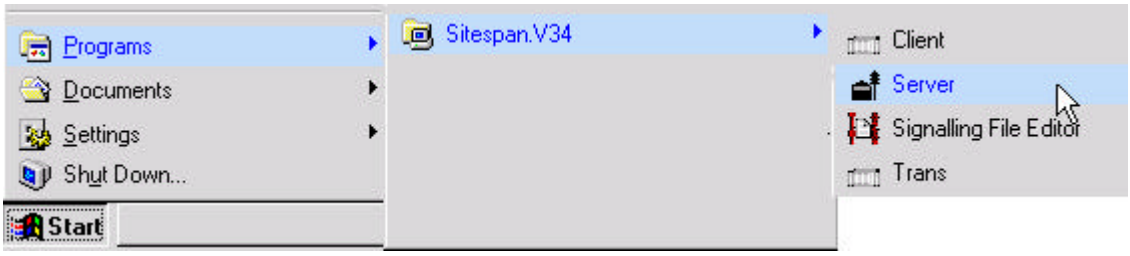
9. Disconnect the Source Server (V2.5).



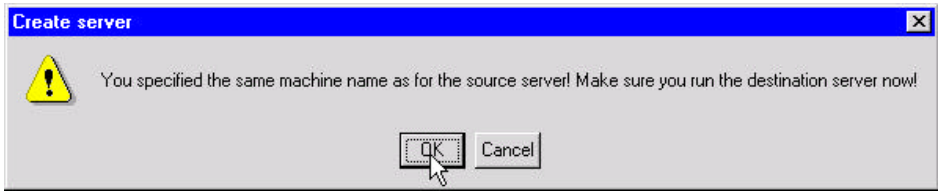
10. Shut down the Sitespan V2.5 Server program



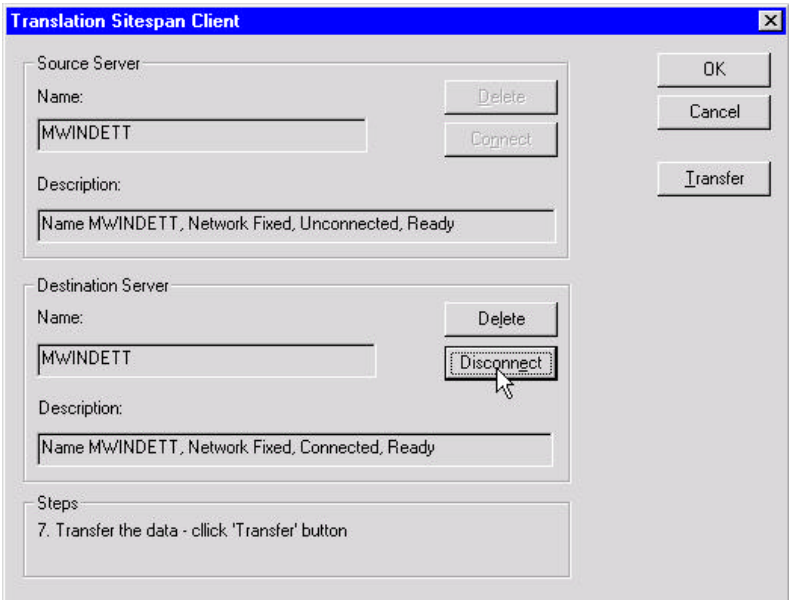
11. Start the Destination Server V3.4



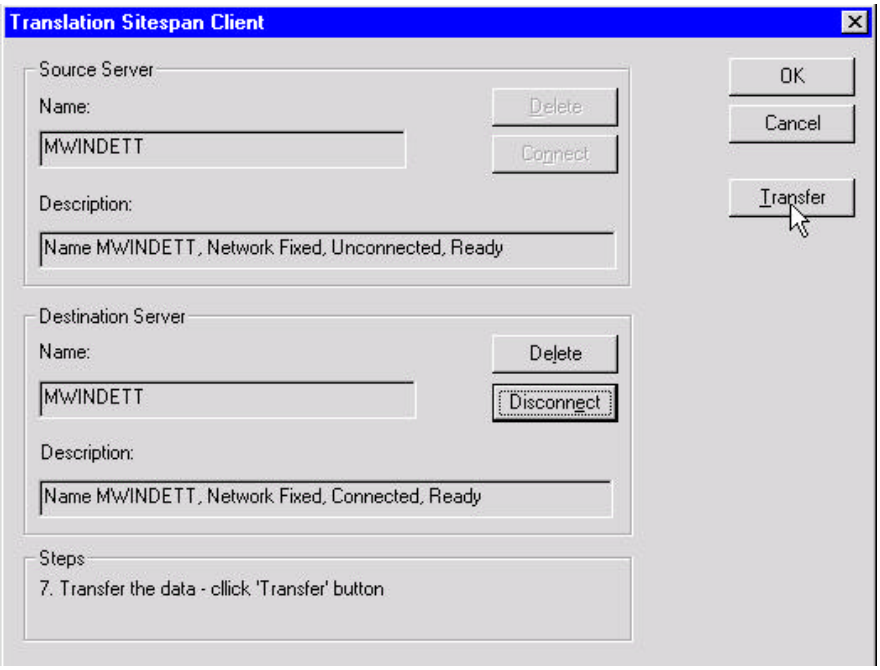
12.Connect to the Destination Server



1. The destination server will indicate that it is connected and ready



2. Click on the Transfer button. This will start converting the V2.5 database to the new V3.4 format



3. A status message will be displayed when the conversion has been completed

4. Close the V3.4 Server and exit the “trans” program.

The files C:server34.olg & C:server34.svd should now be created on your PC.
Your Database is now compatible with the new V3.4 Server & Client applications.

This Page Intentionally Blank